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GREAT FALLS

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URBAN TRANSPORTATION SURVEY

of

GREAT FALLS, MONTANA

CONDUCTED BY

MONTANA STATE HIGHWAY COMMISSION
PLANNING SURVEY DIVISION
IN COOPERATION WITH
U.S. DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS
AND THE
CITY OF GREAT FALLS

VOLUME IV
SEPTEMBER 1965

PREPARED BY

PLANNING SURVEY DIVISION

OF

MONTANA STATE HIGHWAY COMMISSION

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BUREAU OF PUBLIC ROADS

AND

CITY OF GREAT FALLS

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D E F I N I T I O N S

COMPUTER TERMINOLOGY

Link

A portion of the major street network between two nodes.

Minimum Path

The shortest route by time on the major street network from a point of origin to a point of destination.

Network Description

A record which describes in computer language a street or highway system in terms of nodes, links, and operational characteristics.

Node

A numbered point representing an intersection or zone centroid.

Traffic Assignment

A process which estimates vehicular volumes that will use each individual portion of the major street network.

Tree

A record showing the shortest time paths from a given node to all other nodes on the major street network.

Zone Centroid

That point which is designated to represent the center of trip ends in a zone.

GRAVITY MODEL TERMINOLOGY

Friction Factor

An empirically derived travel time factor which expresses the average area wide effect of spatial separation between zones by time increments. Factors are computed by comparing the Origin and Destination trip distribution with the Gravity Model trip distribution by time increments.

GRAVITY MODEL TERMINOLOGY (Continued)

Gravity Model

A mathematical model used to distribute future trips throughout a study area. Trip distribution by a gravity model is based on the theory that the volume of trips between each pair of zones is directly related to the opportunities for trips to originate and terminate within the zones and inversely related to the resistance of the movement or "friction" of time necessary to make the trip.

Home Based Trip

A one-way trip which has either an origin or destination at a dwelling unit.

Nonhome Based Trip

A one-way trip that does not have either an origin or destination at a dwelling unit.

LAND USE TERMINOLOGY

Dwelling Unit

Living quarters occupied or intended for occupancy by a household or by persons having no other place of residence. On military reservations a "dwelling unit" may be quarters for a family or a single bed in a barracks.

Land Use

The purpose for which land, or structures thereon, is occupied, maintained or leased.

Net Area of Land Use

That portion of the land within the survey area actually devoted to a certain land use. A net acre excludes streets, alleys and undeveloped portions of land.

ORIGIN AND DESTINATION SURVEY TERMINOLOGY

Desire Line

An imaginary line drawn between stations, districts, zones or subzones which connects an origin with a destination directly, without reference to the existing street system.

Destination

The stated terminating point of a single trip.

External Local Trip

A trip with point of origin or point of destination located within the cordon line, the performance of which entails travel through an external interview station.

External Station

Point of interview on the cordon line.

External Survey

That phase of the study in which travel data are obtained by interviewing motor vehicle operators intercepted at external stations located on the principal roads and highways crossing the cordon line.

External Through Trip

A trip with both points of origin or destination located beyond the cordon line, the performance of which entails travel into and through the metropolitan area.

Internal Survey

That phase of the survey in which trip data are obtained by interviewing the residents of a preselected dwelling unit sample and the operators of a representative portion of taxicabs and trucks registered inside the cordon line.

Internal Trip

A trip with both points of origin and destination located inside the cordon line.

Origin

The stated beginning point of a single trip.

Section, District, Zone and Subzone

Major and minor divisions of the metropolitan area for purpose of trip analysis and route assignment.

ORIGIN AND DESTINATION SURVEY TERMINOLOGY (Continued)

Trip

One-way travel between points of origin and destination.

PARKING SURVEY TERMINOLOGY

Central Business District

The center of the shopping, business and social activity in any city.

Demand

The number of parking spaces desired in a given block or area as determined by the destinations of the parked motorists. Demand is measured in both parking spaces and space-hours.

Efficiency Factor

A factor used to convert "theoretical" available space-hours into "practical space-hours". This procedure is necessary to compensate for time lost in entering and leaving parking spaces.

Space-Hour (Practical)

Applied only to space-hours of supply. It is the product of the theoretical space-hours multiplied by an efficiency factor.

Space-Hour (Theoretical)

One space for one hour. Used to measure supply, usage, and demand on a comparable basis. It is reduced through the loss of time in each turn-over of space and through the fact that supply and demand are not parallel throughout the day.

Supply

The number of legal parking spaces available for parking. Supply is measured in vehicle spaces and space-hours.

Turnover

The rate of usage of a facility. It is measured by dividing the number of vehicles parked in a facility in a given period of time by the number of spaces available in the facility.

Usage

The number of vehicles parked, or the number of space-hours used by vehicles that parked.

STREET CLASSIFICATION TERMINOLOGY

Arterial Street

A major street that interconnects traffic generators and important rural highways entering the city. It serves relatively large movements of traffic, and also performs a secondary service function to adjacent land.

Collector Street

A street that serves the internal traffic movements within an area of the city and connects this area and its local streets with arterial streets. A collector street provides service to all adjacent property and local traffic movements.

Local Street

Provides access to abutting property regardless of land use This type of street accounts for a large percentage of the total street mileage but carries only a small percentage of the total vehicle miles of travel.

Major Street Network

That portion of the entire street system which serves the major traffic movements.

Urban Freeway

A multilane divided street facility with no intersections at-grade. This type of facility is used to move traffic on relatively long trips with very little service to adjacent land.

TRAFFIC VOLUME TERMINOLOGY

Average Daily Traffic Volume

The average 24-hour volume of traffic that passes a particular point during a specified year, month, or week.

Peak Hour Traffic Volume

The maximum number of vehicles that pass a particular point during any one hour of a specified period. The peak hour of traffic usually occurs between 4 p.m. and 6 p.m. in an urban area.

Introduction

I N T R O D U C T I O N

The Great Falls Urban Transportation Survey consists of several related activities and phases extending over a considerable period of time. A decision was reached at the start of the study to publish separate volumes of related data as they were developed. In conformity with this decision, three volumes of the Great Falls Urban Transportation Study have now been published as follows:

Volume I

Introduction

Description of Studies

History and Development of Great Falls

Parking Survey

Internal Cordon Counts

Volume II

External Cordon Origin-Destination Survey

Home Interview of Internal Passenger Car Trips

Truck and Taxi Travel Survey

Land Use Inventory

Volume III

Traffic Volumes, Controls and Capacity Surveys

Street Inventory and Classification

Traffic Accident Data

Assignment of Present Traffic Volumes to the Arterial Network

As Volume IV, this report develops and summarizes the following phases of the Great Falls Urban Transportation Study.

Land Use and Population Forecasts -- 1981

Future Trip Projections

Future Trip Distribution and Desire Lines of Travel

The Demand for Future Parking Space

Future Trip Assignment to Committed Street System

Recommended Improvements to Committed Street System

Cost of Recommended Improvements

Survey Summary

S U M M A R Y

The population of the Great Falls Study Area is expected to reach 114,000 by 1981. This is an increase of about 39,300 or 53 percent over the 74,700 persons that were residing in the area in 1961

A population increase of 39,300 persons will require about 13,000 additional dwelling units in the study area by 1981.

Passenger cars are expected to increase from 27,057 to 49,500 or about 82 percent in the 20 years from 1961-1981.

Total vehicular trips, in the study area, should amount to 287,364 on an average weekday in 1981. This is an increase of about 89 percent over the 152,053 trips that were made on an average weekday in 1961.

Total trips per dwelling are expected to increase from 6.4 to 7.8 by 1981. This is an increase of approximately 22 percent from 1961-1981. Vehicular trips per person should increase from 2.03 to 2.52 or 24 percent during the same period.

Dwelling units per net residential acre are expected to decrease from 9.0 to 6.7 in the 20-year period ending in 1981.

All trips with destinations in the central business district should increase from 25,474 to 37,005 or 45 percent from 1961-1981. The central business district should attract about 14 percent of the total trips generated in the area in 1981 compared to 18 percent in 1961.

It is predicted there will be a shortage of about 950 parking spaces in the core of the central business district by 1981.

The recommended 1981 major street system will be comprised of about 111 miles of urban Interstate highways, arterial streets and collector

streets. This is an increase of about 34 miles over the major street system in use in 1961. The recommended 111 mile system amounts to about 35 percent of the total street system expected to be in use by 1981.

The total cost of necessary improvements on the major street system will be about $7,245,000, of which the City's share will be about $2,832,500.

Population and Land Use Forecasts

POPULATION AND LAND USE FORECASTS

An estimate of the traffic volumes that can be expected to use streets in the Great Falls Metropolitan Area by the year 1981 is one of the prime objectives of the Great Falls Urban Transportation Study. Future traffic volumes and patterns will be controlled to a great extent by future population and land use. The projection and distribution of population with the anticipated arrangement of land use, therefore, becomes one of the more important studies of an urban transportation survey.

POPULATION FORECASTS

The population of the Great Falls Study Area is expected to reach 114,000 persons by 1981. This is an increase of about 39,300 persons or 53% over the 74,700 persons that were residing in the area in 1961.

The ratio or stepdown method was used to project the population of the Great Falls Study Area. This method involves using the projections of United States and Montana population made by the U.S. Census Bureau as shown in Exhibit 1 on the following page.

From these projections, population ratios were computed between the United States and Montana, Montana and Cascade County and Cascade County and the Study Area.

Exhibit 2 on page 18 shows the percentage relationship between the United States and Montana populations. In 1920, 0.519% of the U.S. population resided in Montana. This percentage relationship has gradually declined until in 1960 only 0.378% of the U.S. population were residents of Montana. By projecting this downward trend to 1981 it is estimated that Montana will be the residence of about 0.341% of a national population

GREAT FALLS URBAN TRANSPORTATION STUDY

MONTANA AND UNITED STATES POPULATION TRENDS

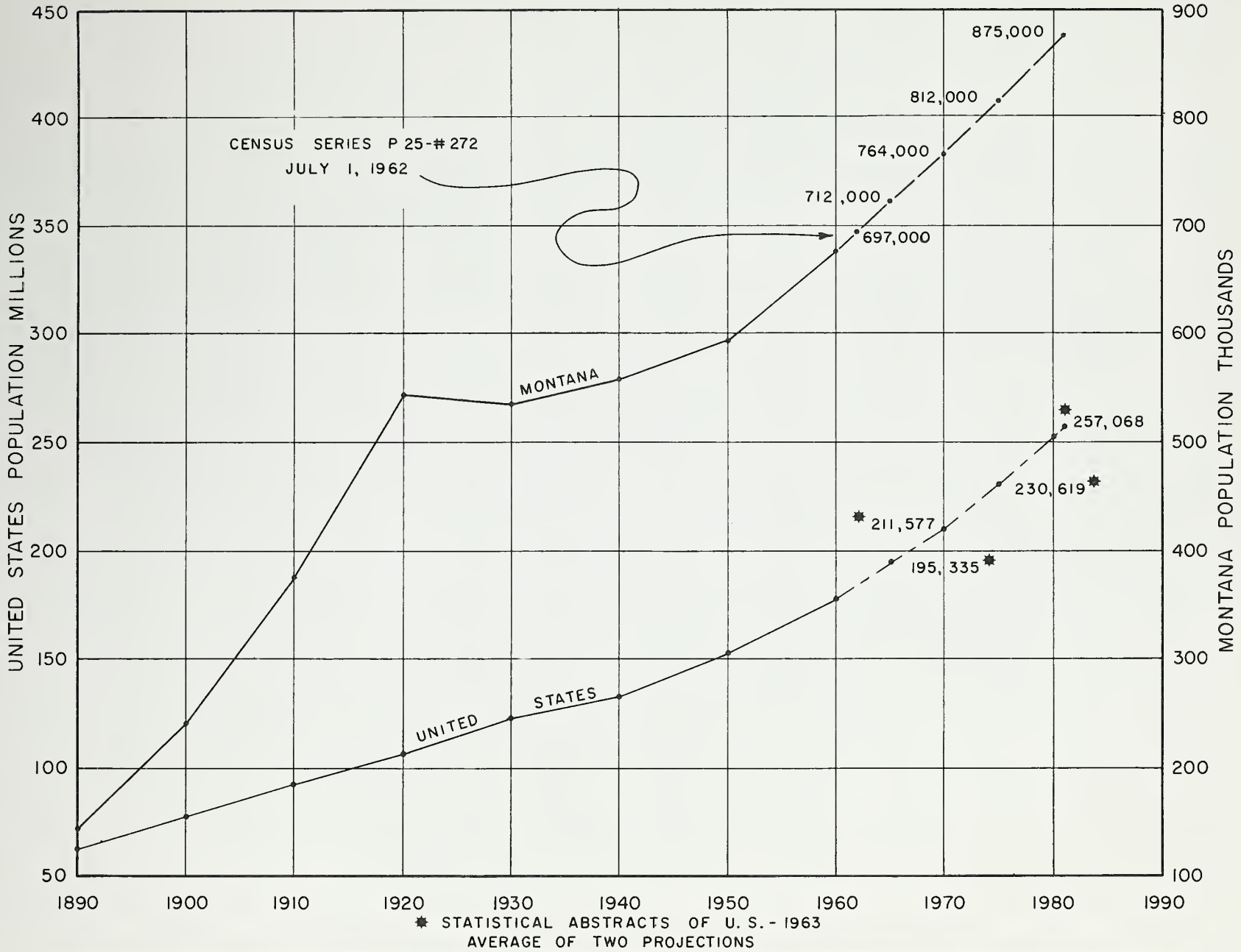


EXHIBIT 1

17

GREAT FALLS URBAN TRANSPORTATION STUDY

PERCENTAGE RELATIONSHIP BETWEEN

MONTANA AND UNITED STATES POPULATION

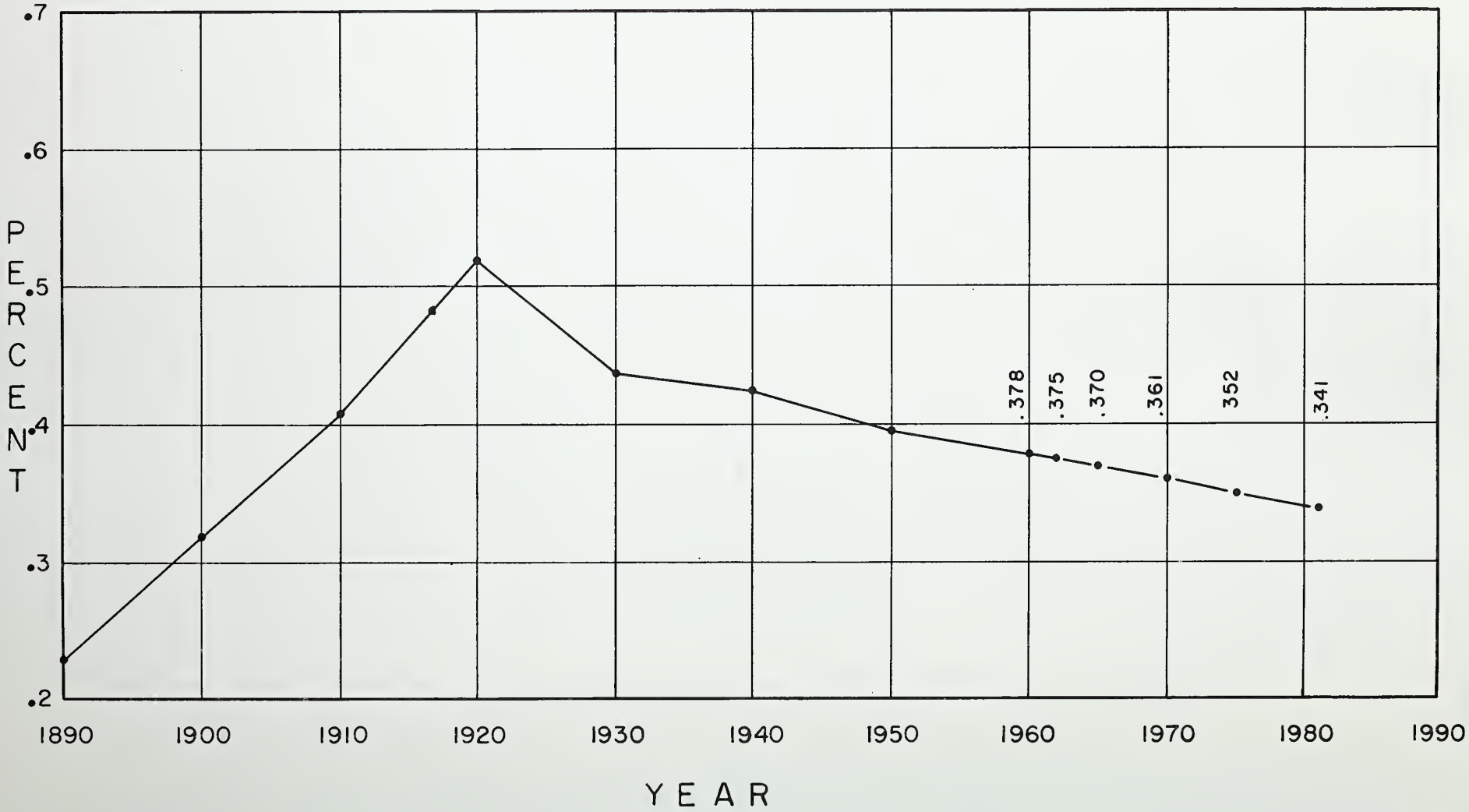


EXHIBIT 2

of 257,068,000. The State then can be expected to have a population of about 875,000 by 1981 as shown in Exhibit 1.

Exhibit 3 on page 20 shows the percentage relationships between the populations of Montana, Cascade County and the Great Falls Study Area. As shown in this exhibit the percentage of Montana residents living in Cascade County has steadily increased since 1940. In 1960 this percentage amounted to 10.88 of the state's population and by 1981 it is estimated that 14.40% of Montana's projected population or 126,000 persons will reside in Cascade County.

Exhibit 4 on page 21 shows the study area in relation to the urbanized area of Great Falls as defined by the U.S. Bureau of Census. It will be noted that the study area is comprised of the standard urbanized area as delimited by the Census Bureau plus Malmstrom Air Base and quite heavily populated areas to the east and south of the urbanized area. About 87.2% of Cascade County's population was residing within the study area in 1960. The construction of a large Minuteman Missile Complex around Malmstrom Air Base in 1961 and 1962 was responsible for an influx of about 10,700 persons into the study area by the fall of 1961. During the same period the population of Cascade County increased about 10,900 persons to 84,300. The percentage relationship between the populations of Cascade County and the study area had also increased to about 88.6% by 1961. If the population of Cascade County follows past trends towards urbanization it is estimated that about 90.5% of the total or 114,000 persons will be residing in the study area by 1981. A comparison of the population distribution in the study area by districts for 1961 and 1981 is illustrated in Exhibit 5 on page 22.

GREAT FALLS URBAN TRANSPORTATION STUDY
PERCENTAGE RELATIONSHIPS BETWEEN THE POPULATIONS
OF MONTANA, CASCADE COUNTY AND THE GREAT FALLS STUDY AREA

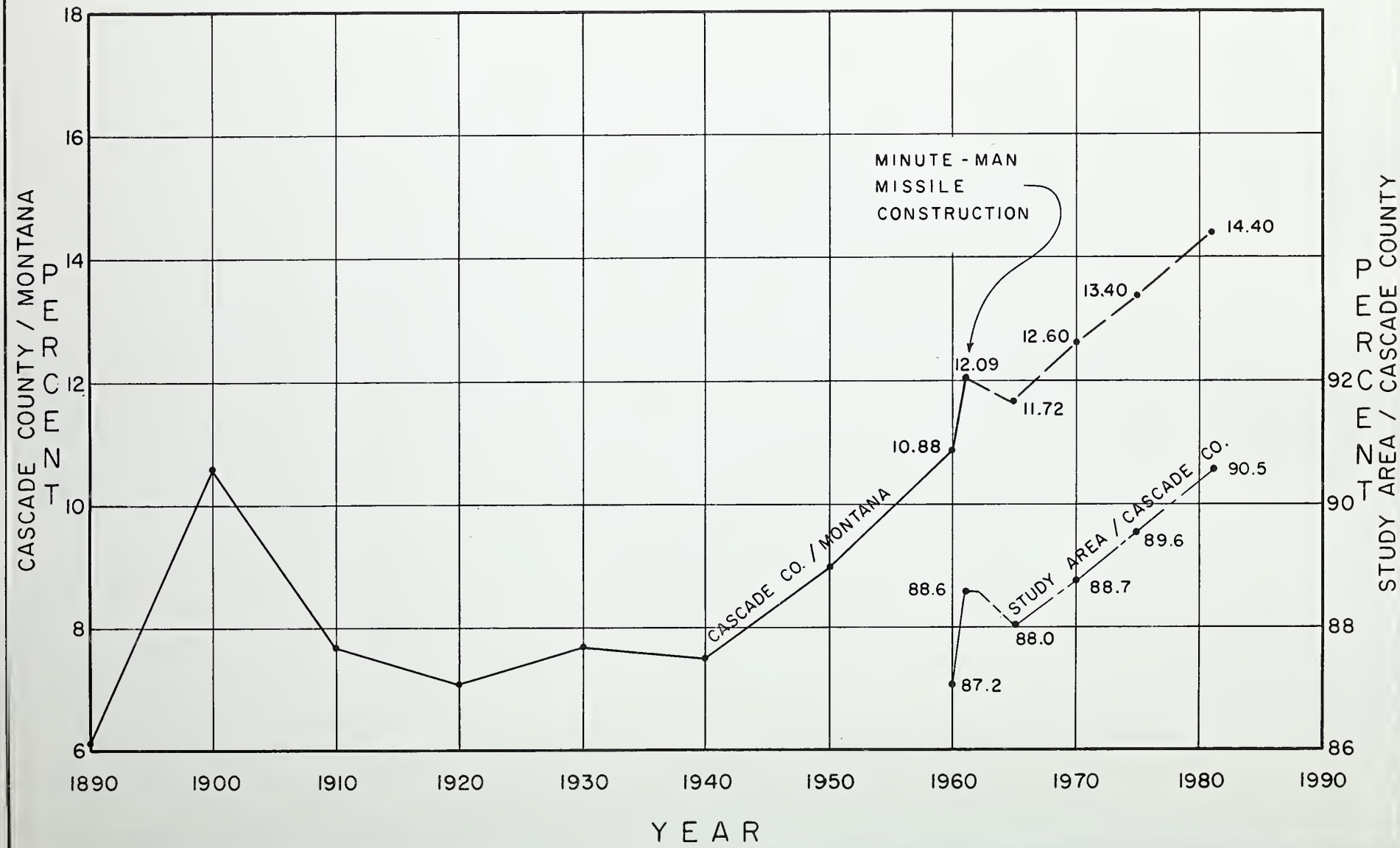
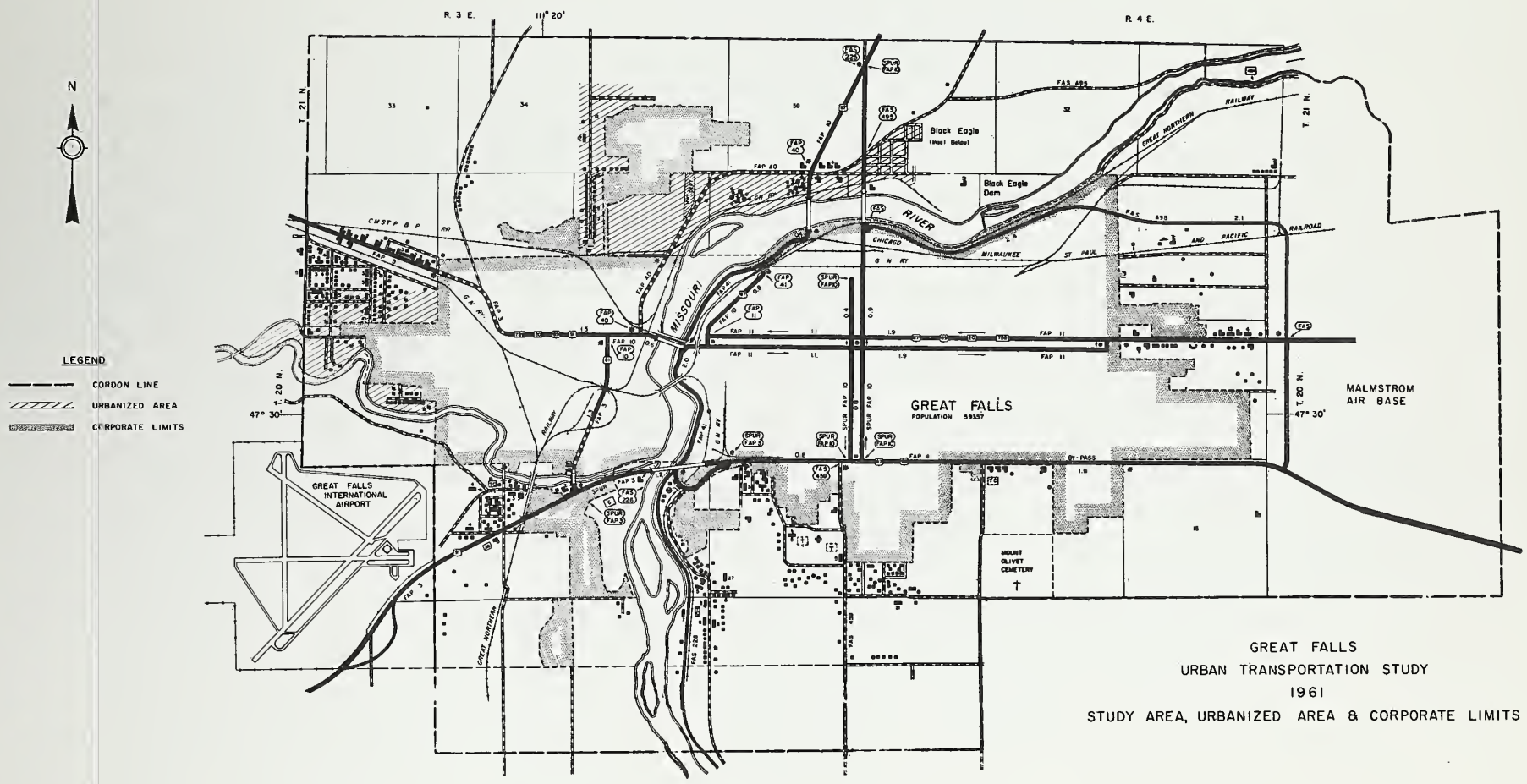
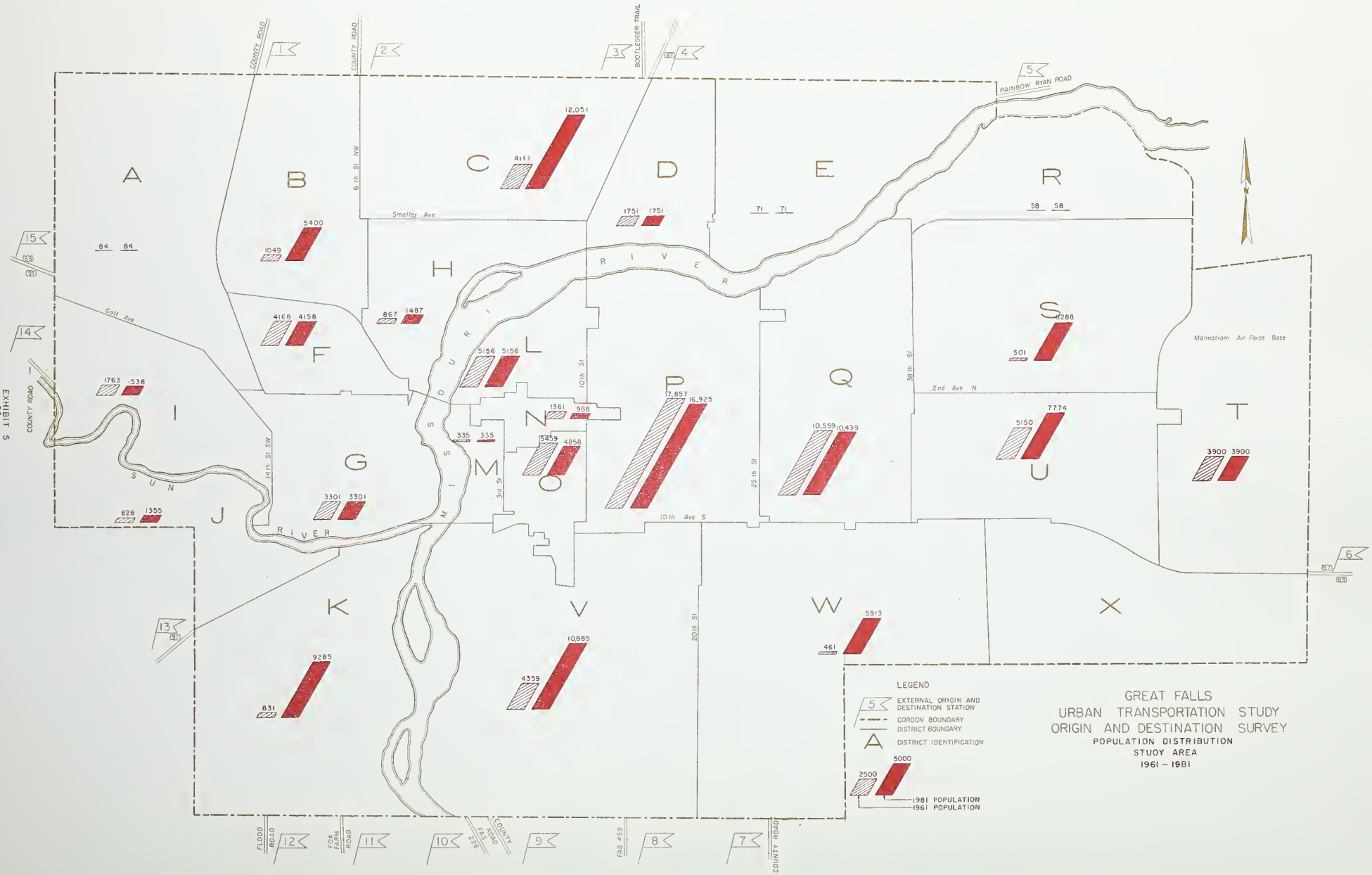


EXHIBIT 3



GREAT FALLS
URBAN TRANSPORTATION STUDY
1961
STUDY AREA, URBANIZED AREA & CORPORATE LIMITS

EXHIBIT 4
21


GREAT FALLS
URBAN TRANSPORTATION STUDY
ORIGIN AND DESTINATION SURVEY
POPULATION DISTRIBUTION
STUDY AREA
1961 - 1981
LEGEND
EXTERNAL ORIGIN AND DESTINATION STATION
CORDON BOUNDARY
DISTRICT BOUNDARY
DISTRICT IDENTIFICATION
1981 POPULATION
1961 POPULATION
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
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1751
1751
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84
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4158
867
1487
5156
5156
1763
1538
1361
988
335
335
5459
4858
17,857
16,925
10,559
10,439
4288
501
5150
7774
3900
3900
3301
3301
828
1355
5913
461
10885
4359
9285
831
Smelter Ave
Golf Ave
2nd Ave N
10th Ave S
Malmstrom Air Force Base
RAINBOW RYAN ROAD
COUNTY ROAD
BOOTLEGGER TRAIL
6th St NW
14th St SW
10th St
3rd St
25th St
38th St
20th St
SUN RIVER
MISSOURI RIVER
FLOOD ROAD
FOX FARM ROAD
COUNTY FAS 922 ROAD
FAS 459
COUNTY ROAD

EXHIBIT 5
22

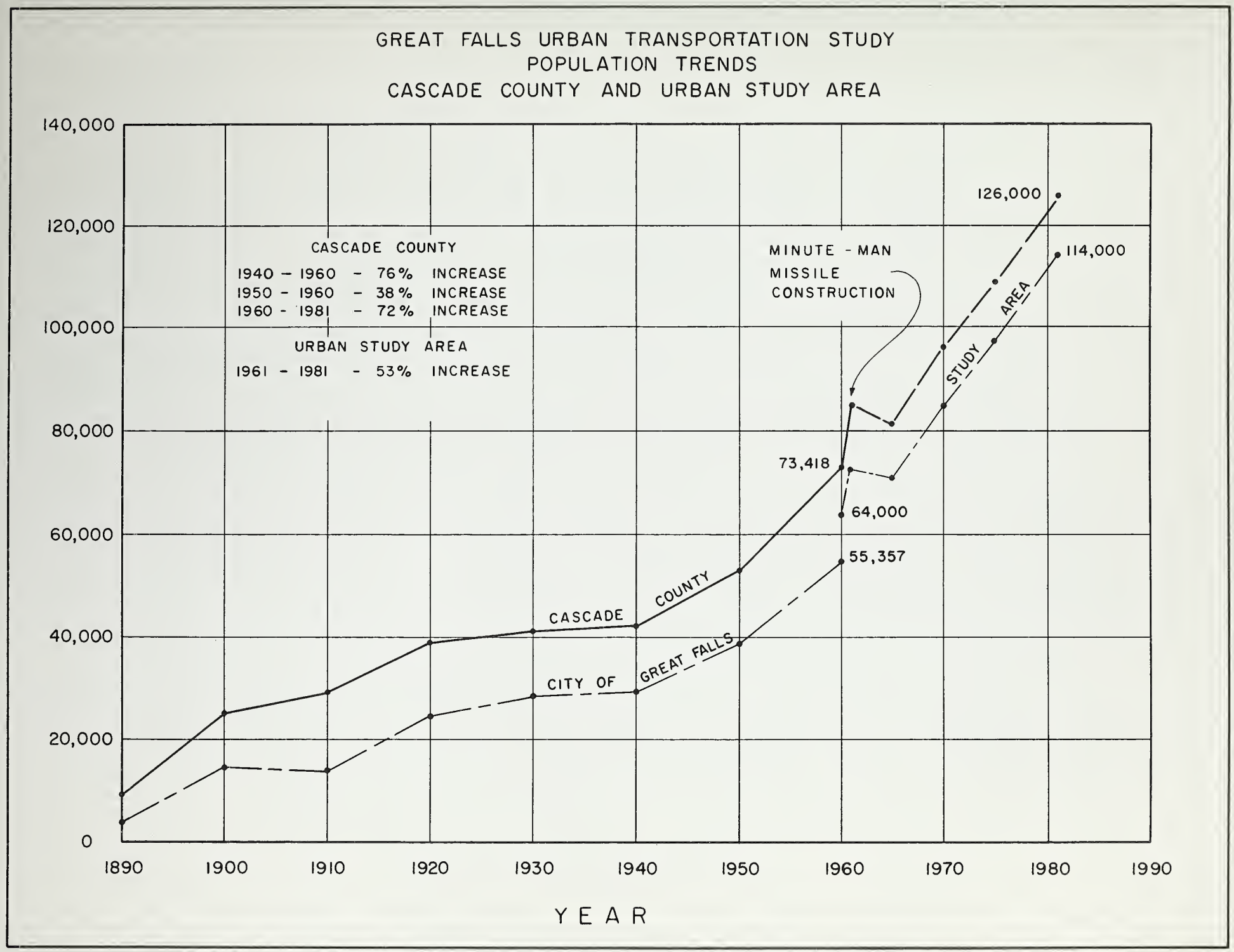
GREAT FALLS URBAN TRANSPORTATION STUDY
POPULATION TRENDS
CASCADE COUNTY AND URBAN STUDY AREA
CASCADE COUNTY
1940 – 1960 – 76% INCREASE
1950 – 1960 – 38% INCREASE
1960 – 1981 – 72% INCREASE
URBAN STUDY AREA
1961 – 1981 – 53% INCREASE
MINUTE - MAN
MISSILE
CONSTRUCTION
126,000
114,000
73,418
64,000
55,357
CASCADE COUNTY
CITY OF GREAT FALLS
STUDY AREA
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
1890
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
YEAR

EXHIBIT 6

GREAT FALLS URBAN TRANSPORTATION STUDY
POPULATION TRENDS
1890 - 1981

	POPULATION					PERCENT		
YEAR	UNITED STATES	MONTANA	CASCADE CO	STUDY AREA	REMAINDER OF CO	MONT/ US	CASCADE CO/ MONTANA	STUDY AREA/ CASCADE CO
1890	62,974,714	142,924	8,755			.227	6.13	
1900	75,994,575	243,329	25,777			.320	10.59	
1910	91,972,266	376,053	28,833			.409	7.67	
1920	105,710,620	548,899	38,836			.519	7.08	
1930	122,755,046	537,606	41,146			.438	7.65	
1940	131,669,275	559,456	41,999			.425	7.51	
1950	150,697,361	591,024	53,027			.392	8.97	
1960	178,464,236	674,767	73,418	64,000	9,418	.378	10.88	87.2
1962	2/185,800,000	2/697,000	84,300	74,700	9,600	.375	12.09	88.6
1965	1/195,335,000	723,000	84,700	74,500	10,200	.370	11.72	88.0
1970	1/211,577,000	764,000	96,300	85,400	10,900	.361	12.60	88.7
1975	1/230,619,000	812,000	108,800	97,500	11,300	.352	13.40	89.6
1981	1/257,068,000	875,000	126,000	114,000	11,900	.341	14.40	90.5

1/ Estimates from U.S. Statistical Abstracts - 1963
Average of high and low fertility rates

2/ Bureau of Census Series P-25 #272

Exhibit 6 on page 23 graphically presents the population trends that have been established for Cascade County, Great Falls and the Urban Study Area. The Summary Table on page 24 shows these same trends in tabular form. Past trends in passenger car registrations, school enrollment, and public utility connections are illustrated in Exhibits 40 through 43 in the appendix.

EMPLOYMENT PROJECTIONS

If the population of the Great Falls Study Area reaches the predicted figure of 114,000 by 1981 it is estimated that about 35% or 40,000 persons will be in the total civilian labor force. In addition to the civilian labor force it is anticipated that the military personnel stationed at Malmstrom Airbase will remain constant at about 4,200 men from 1961-1981. By 1981 the civilian labor force and military personnel will amount to 44,200 persons or about 39% of the total population of the study area

The tabulation on page 26 shows the 1960 labor force by industry for Cascade County and urban Great Falls as obtained from the U.S. Census of Population and the Unemployment Compensation Commission of Montana. This tabulation also shows the estimated projections by industry in the study area for the 20 year period from 1961-1981. The sharp increase in employment from 1960 to 1961 in manufacturing, construction, retail trade, and services again can be attributed to the construction and installation of 150 Minutemen Missiles around the perimeter of Malmstrom Airbase. Employment data obtained from the Montana Unemployment Commission indicate that the number of employed persons dropped back about to the original trend line after completion of the Missile Complex. It is expected that the employment trend,established prior to 1961,will continue through 1981 as illustrated in Exhibit 7 on page 27. Exhibits 8 through 11 on pages 28 through 31 illustrate employment trends by industry from 1940-1981 in

GREAT FALLS URBAN TRANSPORTATION STUDY
LABOR FORCE BY INDUSTRY
1960 - 1981

INDUSTRY	1960 CASCADE CO.	1960 URBAN GREAT FALLS*	1961 STUDY AREA	1981 STUDY AREA
Agriculture, Forestry & Fishing	1,508	382	400	400
Mining, Manufacturing & Construction	5,459	4,584	8,000	8,500
Transportation & Utilities	2,296	1,989	2,000	2,500
Wholesale Trade	1,064	963	1,100	2,100
Retail Trade	4,667	4,181	4,700	6,300
Finance, Insurance & Real Estate	1,257	1,175	1,400	3,300
Services	5,698	5,019	5,600	9,800
Government	1,601	1,392	1,500	3,200
Miscellaneous & Not Reported	634	543	700	1,400
Unemployed	1,598	1,400 Est.	1,500	2,500
Total Civilian Labor Force	25,782	21,628	26,900 Est.	40,000
Armed Forces	4,187	———	4,200	4,200
Grand Total	29,969	21,628	31,100	44,200
Total Population	73,418	57,629	74,700	114,000
Civilian Labor Force Compared to Population	35.1%	37.5%	36.0%	35.1%

* As delimited by 1960 census.

GREAT FALLS URBAN TRANSPORTATION STUDY

TOTAL CIVILIAN EMPLOYMENT

CASCADE COUNTY AND THE STUDY AREA

1940 – 1981

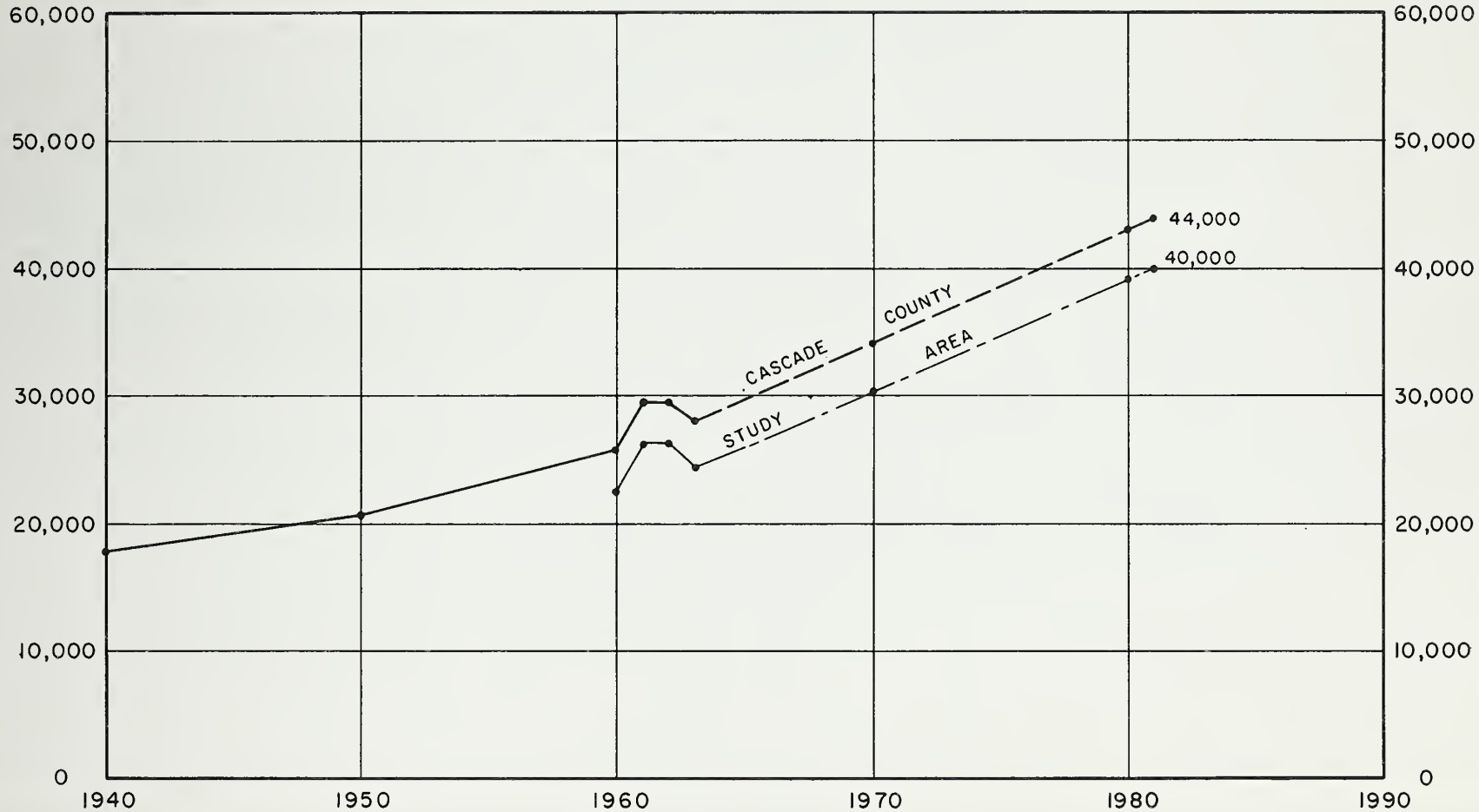

EXHIBIT 7

GREAT FALLS URBAN TRANSPORTATION STUDY

CIVILIAN EMPLOYMENT

SERVICES, FINANCE, INSURANCE AND REAL ESTATE

1940 – 1981

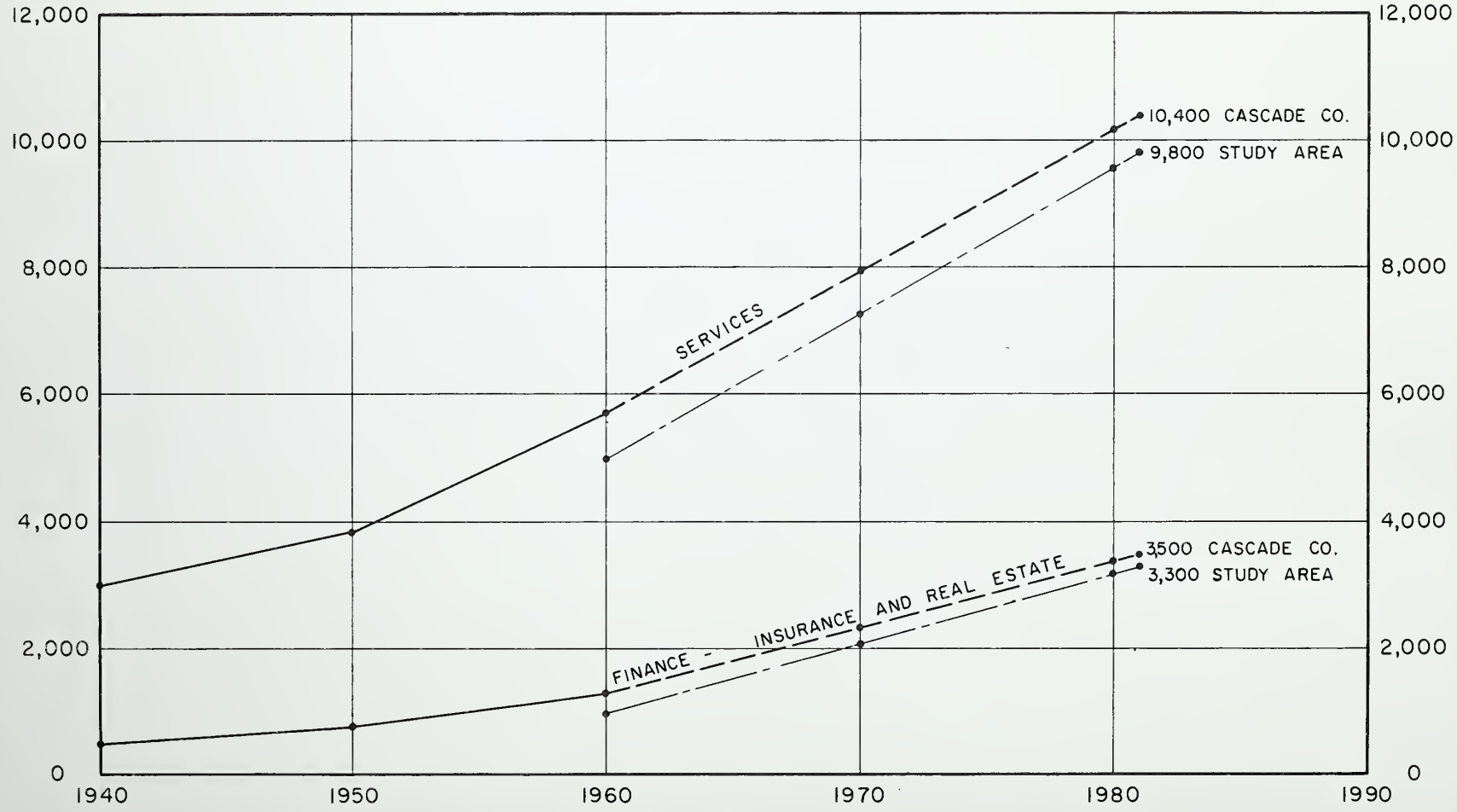

EXHIBIT 8

GREAT FALLS URBAN TRANSPORTATION STUDY

CIVILIAN EMPLOYMENT

MANUFACTURING, MINING, CONSTRUCTION AND AGRICULTURE

1940 – 1981

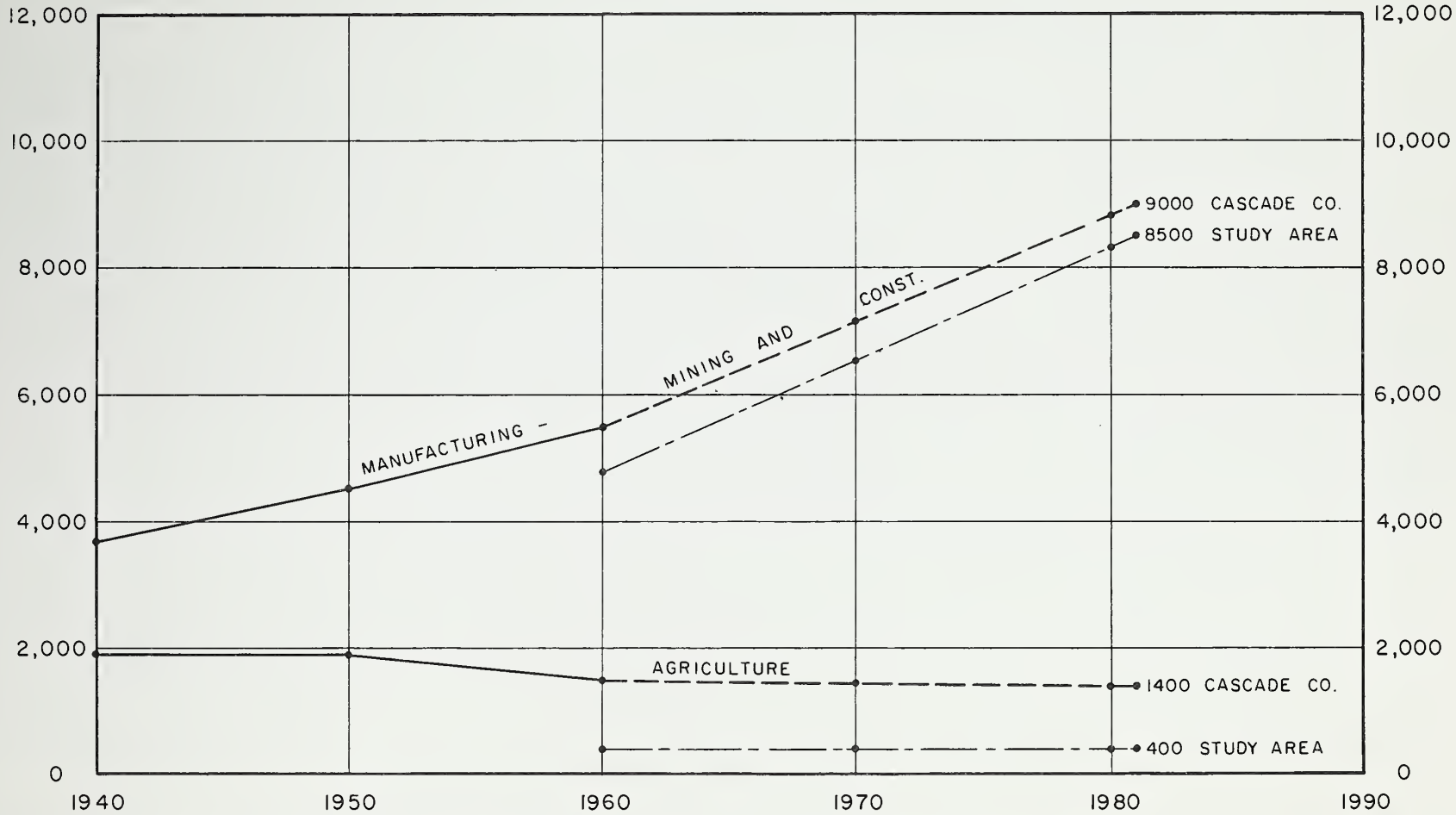

EXHIBIT 9

GREAT FALLS URBAN TRANSPORTATION STUDY

CIVILIAN EMPLOYMENT

WHOLESALE AND RETAIL TRADE - TRANSPORTATION AND UTILITIES

1940 - 1981

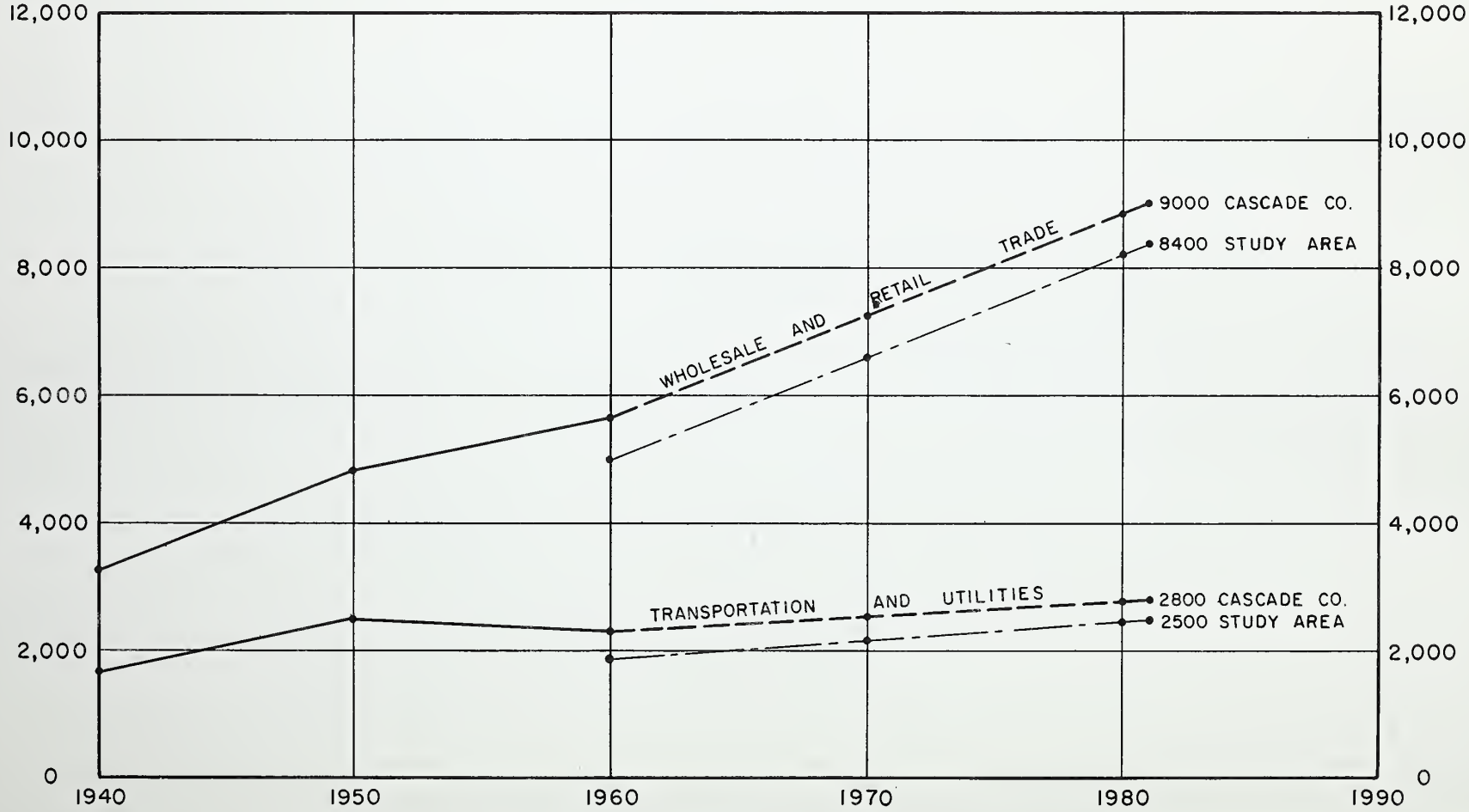

EXHIBIT 10

GREAT FALLS URBAN TRANSPORTATION STUDY

CIVILIAN EMPLOYMENT

GOVERNMENT, MISCELLANEOUS AND NOT REPORTED

1940–1981

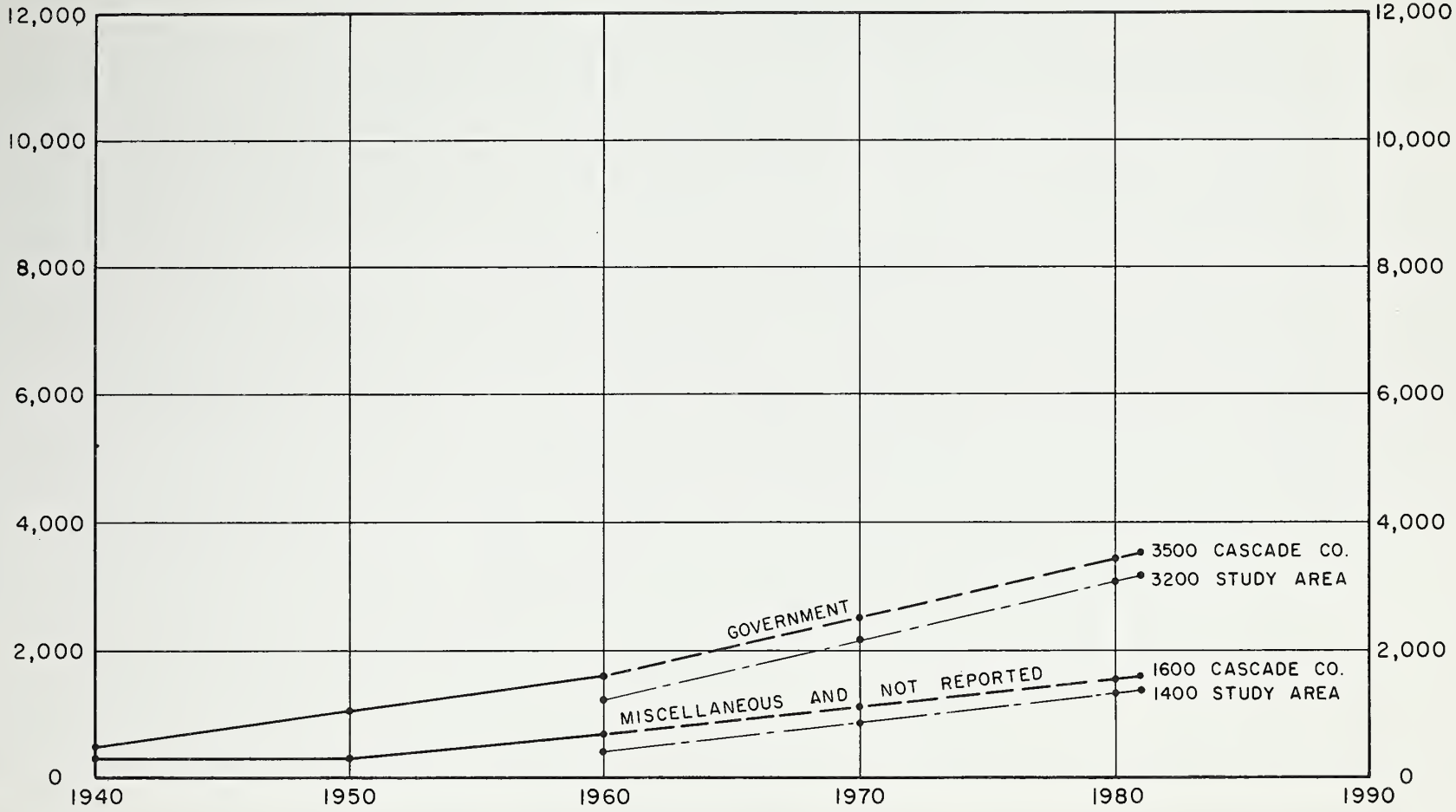

EXHIBIT 11

Cascade County and the Great Falls Study Area.

FUTURE LAND USE

An estimated population in 1981 of 114,000 persons, in the Great Falls survey area, will require additional land suitable for the location of about 13,000 dwelling units. This population will also require additional land on which to construct commercial and industrial establishment, public buildings, schools, parks, etc. The location and the pattern in which this additional land is developed will be a decisive factor in projecting traffic volumes 20 years into the future.

Exhibit 12 on the opposite page illustrates the estimated generalized land use in the Great Falls Study Area in 1981. The pattern of projected land use illustrated in this Exhibit reflects the best judgement of officials representing the City-County Planning Board, local public utility companies, schools and consulting engineers for the Great Falls Water Department. Planned new developments such as shopping centers, schools, parks, government buildings, and commercial and industrial sites are located in a general manner in this Exhibit.

Most of the outlying residential areas where the greatest population growth will occur had been platted on contour maps by the City-County Planning Board prior to 1961. Streets were established in these areas and most of the lot sizes were determined. These plats were invaluable in estimating the amount of land suitable for residential purposes and the future population density per net residential acre.

Public utilities will be one of the predominant factors in controlling the location of future residential growth in the Great Falls Study Area. Black and Veatch, consulting engineers, in their Great Falls Water

Cascade County and the Great Falls Study Area.

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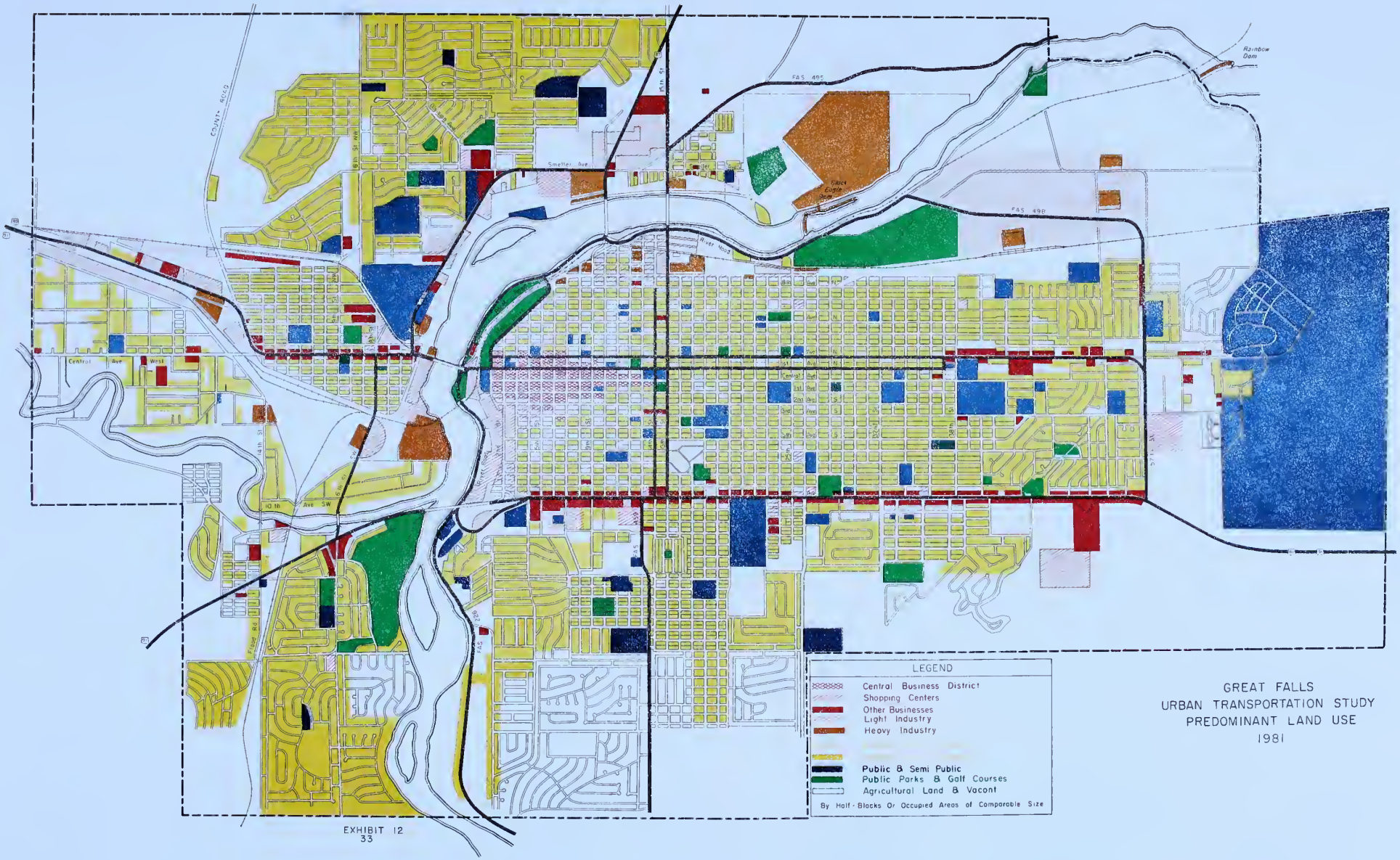


GREAT FALLS
URBAN TRANSPORTATION STUDY
PREDOMINANT LAND USE
1981

EXHIBIT 12

System Planning Study, stated that the most probable areas of future development were found to be (1) to the east between the present city limits and Malmstrom Air Force Base (2) to the south and west of the Sun and Missouri Rivers and (3) to the west and north of U.S. 87 and Smelter Avenue. Residential growth east of the Missouri River and south of 10th Avenue South will be restricted to a great extent by future sewage disposal problems.

Additional string commercial development is expected to occur along the "Miracle Mile" of 10th Avenue South and some residential property in this area will necessarily be abandoned to commercial use. Two new shopping centers are also in the planning stage near the brickyard south of Smelter Avenue and west of 10th Street and near Malmstrom Airbase east of 57th Street and south of 3rd Avenue South. Commercial development in the CBD is expected to remain about constant.

The largest industrial development should occur in the northeast sector of the study area between the Milwaukee and the Great Northern Railroads. This area is also served by FAS 498 and is near the Missouri River. Some industrial development should also locate in the northwest section of Great Falls between proposed I 15 and the Great Northern Railway.

The projected 1981 land use in the Great Falls Study Area is compared with similar data for 1961 in the tabulation on page 36. Land use data for 1961 and 1981 are also tabulated by traffic zones in Appendix Tabulation on page 133.

EXISTING 1961 LAND USE AND ESTIMATED 1981 LAND USE
BY MAJOR CATEGORIES

Land Use Category	1961 Net Acres	1981 Additional Net Acres	1981 Total Net Acres
Residential	2,651.8	2,846.9	5,498.7
Commercial	290.2	300.9	591.1
Industrial	1,144.3	604.0	1,748.3
Public & Semipublic	2,156.2	364.6	2,520.8
Streets & Alleys	2,428.4	902.6	3,331.0
Subtotal Developed	8,670.9	5,019.0	13,689.9
Vacant & Agriculture	11,893.6	-2,223.0	9,670.6
Total Land	20,564.5	2,796.0*	23,360.5

(* Additional residential areas were included within the cordon on the south to provide land for future development.)

Harland Bartholemew, in his publication "Land Use in American Cities," reports on a study of major categories of land use in 53 cities of under 250,000 population. A comparison of Great Falls with a composite of these 53 cities is shown in the following tabulation:

USE OF DEVELOPED LAND

Type of Land Use	Composite Cities	Great Falls 1961	Great Falls 1981
Residential	39.6%	30.4%	40.2%
Commercial	3.3	3.3	4.3
Light & Heavy Industrial	11.3	13.8	12.8
Streets and Alleys	28.1	27.8	24.3
Public & Semipublic	17.7	24.7*	18.4*
Total Developed Land	100.0%	100.0%	100.0%

* Includes Malmstrom Air Force Base.

A summary of the various economic and social factors that are expected to influence future traffic volumes within the study area is shown in the tabulation on the following page.

GREAT FALLS URBAN TRANSPORTATION STUDY
SUMMARY OF SOCIAL - ECONOMIC DATA
STUDY AREA 1961 - 1981

Item	1961 Survey Data	1981 Estimate	Increase or Decrease Number	Increase or Decrease Percent
Dwelling Units	23,815	36,800	+ 12,985	+ 54.5
Population	74,735	114,000	+ 39,265	+ 52.5
Net Residential Acres	2,651.8	5,498.7	+ 2,846.9	+ 107.4
Persons Per Residential Acre	28.2	20.7	- 7.5	- 26.6
D. U. Per Residential Acre	9.0	6.7	- 2.3	- 25.6
Persons Per D. U.	3.1	3.1		
Passenger Cars Owned	27,057	49,500	+ 22,443	+ 82.9
Persons Per Passenger Car	2.76	2.30	- 0.46	- 16.7
Passenger Cars Per D. U.	1.1	1.3	+ 0.2	+ 18.2
Civilian Labor Force	26,900	40,000	+ 13,100	+ 48.7
Total Civilian Employment	25,400	37,500	+ 12,100	+ 47.6
Industrial Employment	11,100	13,100	+ 2,000	+ 18.0
Commercial Employment *	13,900	24,000	+ 10,100	+ 72.7
Military Personnel	4,187	4,200	+ 13	
Industrial Acres	1,144.3	1,748.3	+ 604.0	+ 52.8
Industrial Employment Per Acre	9.7	7.5	- 2.2	- 22.7
Commercial Acres	290.2	591.1	+ 300.9	+ 103.7
Commercial Employment Per Acre	47.9	40.6	- 7.3	- 15.2
Total All Vehicular Trips	152,053	287,364	+ 135,311	+ 89.0
Vehicular Trips Per D. U.	6.4	7.8	+ 1.4	+ 21.9
Vehicular Trips Per Person	2.03	2.52	+ 0.49	+ 24.1

* Includes Government and Miscellaneous

Future Trip Projections

FUTURE TRIP PROJECTIONS

The projections of population, employment, vehicle registration, and land use were all used in estimating the number of trips that will be made on the city streets of Great Falls 20 years in the future. Planning a future street system that will adequately accommodate future traffic volumes is the ultimate goal of an Urban Transportation Study.

TRIP PROJECTIONS - EXTERNAL

Future trip generation at each external station was estimated separately from the internal travel. Past traffic trends at each station as well as the future use of land in the various traffic corridors were taken into consideration. Estimates of traffic, previously made at the two stations located on the Interstate system, were adjusted to 1981 volumes and used without change.

It is expected that all external travel will increase by about 87 percent by 1981. The estimated increase by individual stations is as follows:

STATION NUMBER	DESCRIPTION	TRAFFIC VOLUMES 1961	1981	RATIO 1961 - 1981
3	Bootlegger Trail	232	422	1.82
4	U.S. 87 North	1,839	3,225	1.75
5	Rainbow Dam Road	158	226	1.43
6	U.S. 87 East	3,897	6,274	1.61
7	26th Street Extension	513	1,023	1.99
8	13th Street Extension	1,349	2,808	2.08
9	Dempsey Inn Road	199	473	2.38
10	River Road	1,871	3,350	1.79
13	Interstate 15 South	5,953	10,217	1.72
14	Central Avenue West	374	584	1.56
15	Interstate 15 West	4,331	10,162	2.35
	TOTAL	20,716	38,764	1.87

It is estimated that through, nonstop trips between external stations will increase from 932 in 1961 to 2,672 in 1981.

TRIP PROJECTIONS - INTERNAL

Zone to zone trips movements, made within the study area in 1961, were converted to zonal productions and attractions to facilitate future projections. The nine trip purposes and three modes of travel used in the internal origin and destination survey were condensed into three basic categories consisting of home based work trips, other home based trips and nonhome based trips. The nonhome based trips were further split between those made by automobiles and trucks.

The dwelling unit has been found to be the basic generator of about 73 percent of the internal automobile driver trips in Great Falls. All trips in the "home based" category either begin or end at a dwelling unit. The 1961 population was, therefore, projected to 1981 by traffic zones and the necessary number of dwelling units required to house the 1981 population were computed and located within each traffic zone. The estimated 1981 dwelling unit data then became the base for future trip projections.

The number of automobiles per dwelling unit was found to be the most stable indicator of trips per dwelling as shown in Exhibit 13 page 42. Various other factors such as distance from CBD, value of dwelling units and dwelling unit densities were tried in regression equations with unsatisfactory results. It is believed that these variables in trip generation are not as pronounced in a city the size of Great Falls as they are in a larger metropolitan area.

It is estimated that there will be about 49,500 passenger cars

GREAT FALLS URBAN TRANSPORTATION STUDY
AUTOS PER DWELLING
VS.
AUTO TRIPS PER DWELLING
BY TRAFFIC ZONE
COEFFICIENT OF CORRELATION 0.853

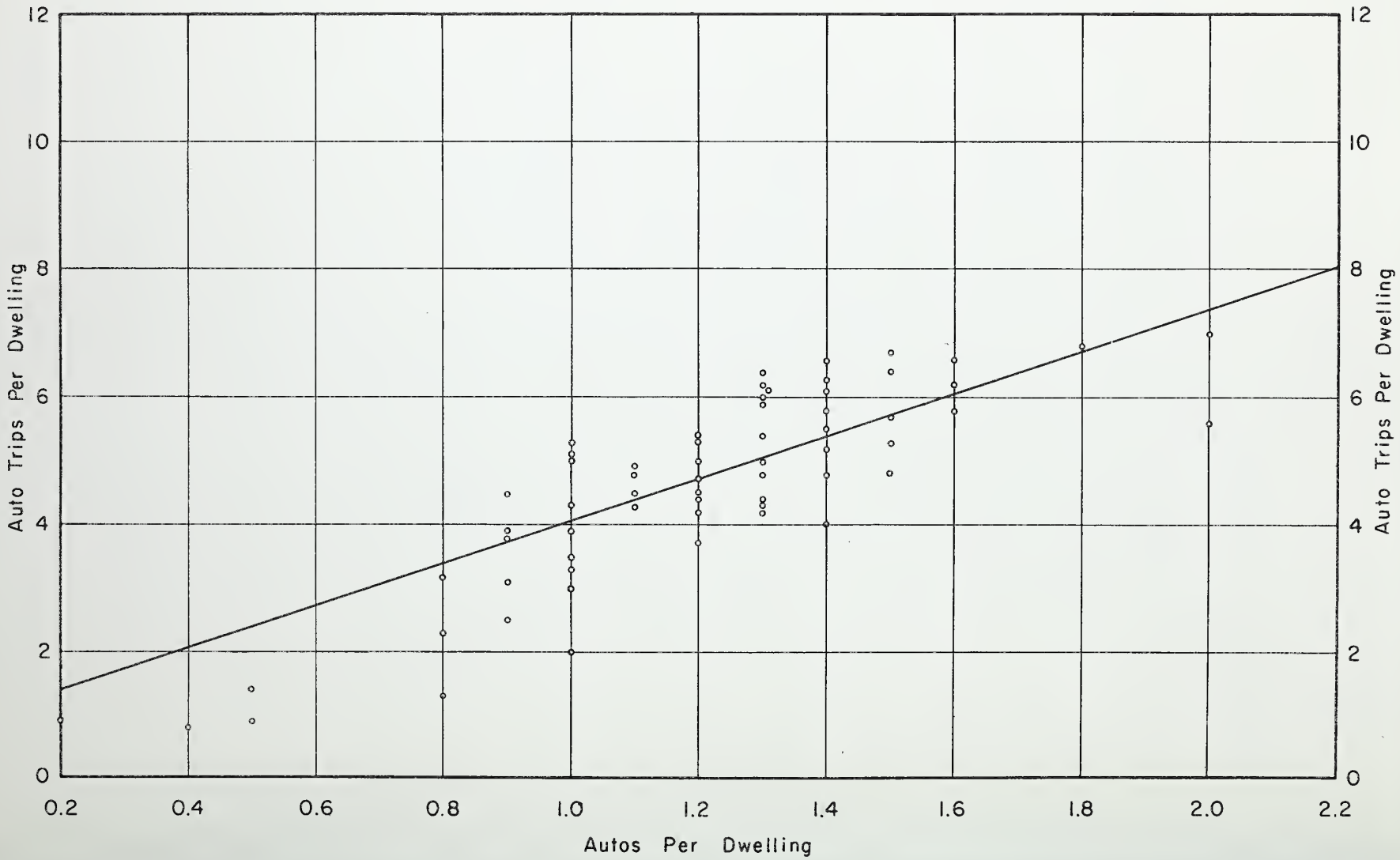


EXHIBIT 13
42

registered within the study area by 1981. This is an 83% increase over the 27,057 automobiles registered in 1961. It is expected that the average number of automobiles per dwelling unit will increase from 1.1 in 1961 to 1.3 in 1981. Passenger cars per person are expected to increase from 0.36 to 0.43 during the same period. The availability of more passenger cars per dwelling unit combined with more leisure time and income is expected to increase the overall trip generation per dwelling unit by about 24% by 1981.

TRIP PRODUCTION - 1981

The distribution of projected automobile registrations by traffic zones is shown in tabular form in the appendix. The projected number of automobiles per dwelling unit as shown in this tabulation, was used as a general check on the total number of automobile trips produced in each zone. This check was made by relating the projected number of automobiles per dwelling unit, as listed in the appendix tabulation, with the expected number of trips per dwelling unit as shown in Exhibit 13 on page 42. The number of trips per dwelling unit thus obtained was multiplied by the projected number of dwelling units in each traffic zone. The product became an estimate of the total number of future automobile trips that could be expected to be produced in each zone regardless of trip purpose. The estimated total number of automobile trip productions obtained by this method was used as an overall check on the future trip productions by trip purpose which were obtained by solving the following equations.

1. Home Based Work Trips

$$\frac{\text{No. Trips 1961}}{\text{Population 1961}} \times \text{Population 1981}$$

2. Home Based Shopping Trips

$$\frac{\text{No. Trips 1961}}{\text{Population 1961}} \times \text{Population 1981}$$

3. Home Based School Trips

$$\frac{\text{No. Trips 1961}}{\text{Population 1961}} \times \text{Population 1981}$$

4. Home Based Miscellaneous Trips

$$\frac{\text{No. Trips 1961}}{\text{No. Autos 1961}} \quad \text{X No. Autos 1981}$$

5. Nonhome Based Trips

$$\frac{\text{No. Trips 1961}}{\text{Population 1961}} \quad \text{X Population 1981}$$

The sum of the five separate trip expansions was in some instances slightly lower than the total trip productions obtained by the comparison of automobiles per dwelling with trips per dwelling. In these cases Home Based Miscellaneous and Nonhome Based Trips were adjusted to bring the two totals into approximate agreement.

TRIP ATTRACTIONS - 1981

The estimation of trip attractions to each traffic zone was accomplished by solving the following equations involving population, employment, school enrollment and net retail floor space:

1. Home Based Work Trips

$$\frac{\text{No. Trips 1961}}{\text{Employment 1961}} \quad \text{X Employment 1981}$$

2. Home Based Shopping Trips

$$\frac{\text{No. Trips 1961}}{\text{Retail Floor Space 1961}} \quad \text{X Retail Floor Space 1981}$$

3. Home Based School Trips

$$\frac{\text{No. Trips 1961}}{\text{School Enrollment 1961}} \quad \text{X School Enrollment 1981}$$

4. Home Based Miscellaneous Trips

$$\frac{\text{No. Trips 1961}}{\text{Population 1961}} \quad \text{X Population 1981}$$

5. Nonhome Based Trips

$$\frac{\text{No. Trips 1961}}{\text{Population 1961}} \quad \text{X Population 1981}$$

Since total trips attracted to the various zones must equal total trips produced, trip attractions were adjusted to balance with productions before being distributed throughout the study area.

SUMMARY OF 1981 TRIP PROJECTIONS

It is estimated that all vehicular travel in the study area will increase by 89 percent during the 20 year period from 1961 to 1981. A comparison of the 1961 and 1981 data by type of trip and vehicle type is shown in the following tabulation:

TYPE OF TRIP	VEHICLE TYPE	NUMBER OF TRIPS 1961	1981	RATIO 1961-1981
Internal Trips				
Between Zones				
	Passenger Car	111,919	211,613	1.89
	Truck	19,418	36,987	1.90
Total Internal Trips		131,337	248,600	1.89
External Trips				
Zone - Station				
	Passenger Car	15,226	28,602	1.88
	Truck	4,558	7,490	1.64
Subtotal External Trips		19,784	36,092	1.82
Between Stations				
	Passenger Car	680	2,400	3.53
	Truck	252	272	1.08
Subtotal Through Trips		932	2,672	2.87
Total External Trips		20,716	38,764	1.87
Total Passenger Car Trips		127,825	242,615	1.90
Total Truck Trips		24,228	44,749	1.85
GRAND TOTAL - All Trips		152,053	287,364	1.89

In this tabulation taxis are included with passenger cars and pick-ups and light panels are classified as trucks.

Future Trip Distribution

FUTURE TRIP DISTRIBUTION

GENERAL

It has been proven, in a large number of urban transportation studies, that a mathematical model may be developed to distribute future trips throughout a study area for any year for which land use data are available. In essence, a trip distribution gravity model states that the volume of trips between each pair of zones will be directly related to the opportunities for trips to originate and terminate within the zones and inversely related to the resistance of the movement or the "friction" of time necessary to make the trip. This concept of trip distribution is similar to the gravity principle expressed in Newton's Law.

THE GRAVITY MODEL

The gravity model or trip distribution equation may be stated as follows:

$$T_{(i-j)} = \frac{P_i A_j F_{(t_{i-j})} K_{(i-j)}}{\sum_{x=1}^{n} A_x F_{(t_{i-x})} K_{(i-x)}}$$

T_{i-j} = Trips produced in zone i and attracted to zone j

P_i = Total trips produced in zone i

A_j = Total trips attracted to zone j

$t_{(i-j)}$ = Travel time between zone i and zone j

F = An empirically derived travel time factor which expresses the average area wide effect of spatial separation.

K = A specific zone to zone adjustment factor used to adjust for social or economic linkages not otherwise accounted for in the model. (It was not considered necessary to use this factor in Great Falls.)

n = Number of zone centroids

In order to use the gravity model, in trip distribution, four basic elements of data are required for each trip purpose. These elements are:

1. The number of trips produced by each zone.
2. The number of trips attracted by each zone.
3. The time required to travel from each zone to all other zones including intrazonal and terminal time.
4. An empirically derived friction factor which expresses the area wide effect of spatial separation between zones by time increments.

The first two items are actually the trip productions and attractions by trip purpose, as obtained from the Origin and Destination Survey for 1961 and as estimated for 1981.

The third necessary element of driving time between zones was obtained from traveltime studies, made on all streets comprising the major street network in 1961. Intrazonal driving time was assumed to be an average of one minute for each zone. Terminal time, which includes the time required to park a vehicle and walk to the drivers primary destination, varied from a minimum of one minute in most residential zones to five minutes in the central business district.

The friction factors, used in the gravity model, were obtained by comparing the 1961 Origin and Destination Survey distribution of all trips by time intervals with the gravity model distribution of synthetic trips by the same time intervals. The friction factors for each time interval were then progressively adjusted until the distribution of synthetic trips by the model coincided with the original Origin and Destination Survey data.

CALIBRATING AND TESTING THE GRAVITY MODEL

The theory, of trip distribution by a mathematical gravity model, is

that if the model can be calibrated to approximate existing travel within an area it can then be relied upon to distribute future travel within the same area. Trips obtained in the Origin and Destination Survey were used as a control in the calibration process. Three basic methods were used to calibrate a trip distribution model for each of the four major purposes and modes of travel. Each of these methods is described briefly as follows:

Trip Distribution

This calibration consists of a comparison between the synthetic trips produced by the gravity model and the actual trips obtained in the Origin and Destination Survey by trip frequency and trip length. The "F" or friction factors used in the gravity formula for each one minute time interval were adjusted after each trial run until the average trip length frequencies approximated the origin and destination trip data.

The results of the trip distribution calibrations are tabulated on pages 51 and 52 and are illustrated in Exhibits 14 through 17. A comparison of the average trip length and total hours of travel by trip purpose are summarized in the following tabulation:

	TOTAL HOURS OF TRAVEL - 1961			AVERAGE TRIP LENGTH MINUTES - 1961		
Trip Purpose	O & D	Model	Percent	O & D	Model	Percent
Home Based Work	3,775.3	3,717.4	-1.5	11.10	11.00	-0.1
Other Home Based	9,495.4	9,461.7	-0.4	9.62	9.55	-0.7
Nonhome Based	11,790.2	12,355.8	+4.8	10.17	10.36	+1.9
Trucks	3,665.8	3,662.4	-0.1	9.07	9.06	-0.1

As a tolerance of $\pm$ 5 percent is considered acceptable in this phase of the model calibration, the discrepancies between the origin and destination and the synthetic trips shown in the above tabulation are within the desirable limits of accuracy for assignment purposes.

GREAT FALLS URBAN TRANSPORTATION STUDY
PERCENTAGE DISTRIBUTION OF TRIPS BY TIME INTERVALS GRAVITY MODEL CALIBRATION

TRIP LENGTH MINUTES	HOME BASED WORK TRIPS				OTHER HOME BASED TRIPS			
	FRICTION FACTORS	1961 O & D PERCENT	1961 MODEL PERCENT*	1981 MODEL PERCENT	FRICTION FACTORS	1961 O & D PERCENT	1961 MODEL PERCENT*	1981 MODEL PERCENT
3	105	1.3	1.4	1.4	212	4.8	4.6	4.1
4	115	1.8	2.1	2.3	210	6.1	5.7	6.0
5	110	5.5	5.5	4.8	150	10.5	10.8	8.8
6	100	4.9	4.7	5.6	110	7.4	7.2	7.7
7	90	6.3	6.8	8.0	80	8.3	8.7	8.2
8	84	8.7	9.0	8.6	72	7.8	8.3	8.3
9	77	7.1	7.5	7.8	68	6.8	6.7	6.6
10	72	8.7	9.4	7.9	64	7.4	7.4	6.9
11	68	9.2	8.8	7.5	62	7.3	7.2	6.7
12	65	9.7	9.0	8.6	58	6.6	6.6	6.2
13	62	8.4	8.5	7.2	54	6.8	6.8	6.3
14	61	8.1	7.5	7.9	50	5.0	5.7	5.4
15	60	6.3	5.6	6.6	44	4.8	4.7	5.7
16	59	6.2	6.2	6.7	38	4.4	4.7	5.0
17	55	3.9	3.4	3.6	34	2.7	2.4	3.4
18	52	0.8	1.3	1.9	30	1.0	1.0	1.9
19	48	0.8	1.3	1.4	25	1.6	1.0	1.4
20	40	0.9	0.8	0.9	20	0.3	0.3	0.6
21	30	0.7	0.7	0.9	13	0.4	0.1	0.2
22	18	0.3	0.2	0.2	8	0.0	0.1	0.1
23	12	0.3	0.1	0.1	6	0.1	0.1	0.1
24	8	0.1	0.1	0.1	4	0.1	0.0	0.0
TOTAL TRAVEL TIME (HOURS)		3,775.3	3,717.4	7,127.8		9,495.4	9,461.7	18,936.1
AVERAGE TRIP LENGTH (MINUTES)		11.10	11.00	11.22		9.62	9.55	9.93

* FINAL CALIBRATION WITH BRIDGE IMPEDANCE

GREAT FALLS URBAN TRANSPORTATION STUDY
PERCENTAGE DISTRIBUTION OF TRIPS BY TIME INTERVALS GRAVITY MODEL CALIBRATION

TRIP LENGTH MINUTES	NON-HOME BASED TRIPS				TRUCKS			
	FRICTION FACTORS	1961 O & D PERCENT	1961 MODEL PERCENT*	1981 MODEL PERCENT	FRICTION FACTORS	1961 O & D PERCENT	1961 MODEL PERCENT*	1981 MODEL PERCENT
3	325	5.9	5.9	5.1	465	10.3	10.2	9.6
4	154	3.6	2.9	3.2	205	4.4	4.4	4.7
5	125	6.7	6.0	5.0	150	7.9	7.8	7.6
6	100	5.8	5.2	4.8	100	6.7	6.6	5.7
7	87	6.0	5.7	6.5	75	7.8	7.7	6.8
8	77	8.3	8.0	7.9	60	7.9	8.0	7.3
9	70	7.7	7.3	7.4	55	7.6	7.6	6.6
10	65	7.7	8.1	7.1	50	9.1	9.2	8.6
11	61	10.3	10.7	10.3	47	10.0	10.3	9.7
12	60	8.8	9.9	8.2	43	8.5	8.9	7.2
13	56	7.1	7.5	6.7	41	6.8	6.8	5.9
14	54	6.9	7.2	7.6	38	5.2	5.3	5.6
15	52	4.7	4.9	5.6	34	2.5	2.5	2.6
16	50	4.1	4.9	5.7	30	2.4	2.4	5.0
17	48	2.3	3.1	4.3	26	1.1	1.1	3.0
18	45	2.0	2.0	2.7	23	1.0	1.0	2.0
19	40	1.1	1.0	1.4	18	0.2	0.2	0.4
20	30	0.7	0.5	0.6	15	0.2	0.2	1.0
21	10	0.2	0.1	0.1	12	0.2	0.0	0.0
22	3	0.2	0.1	0.1	7	0.1	0.1	0.7
TOTAL TRAVEL TIME (HOURS)		11,790.2	12,355.8	24,740.4		3,665.8	3,662.4	7,637.2
AVERAGE TRIP LENGTH (MINUTES)		10.17	10.36	10.73		9.07	9.06	9.77

* FINAL CALIBRATION WITH BRIDGE IMPEDANCE

GREAT FALLS URBAN TRANSPORTATION STUDY

GRAVITY MODEL CALIBRATION

HOME BASED WORK TRIPS

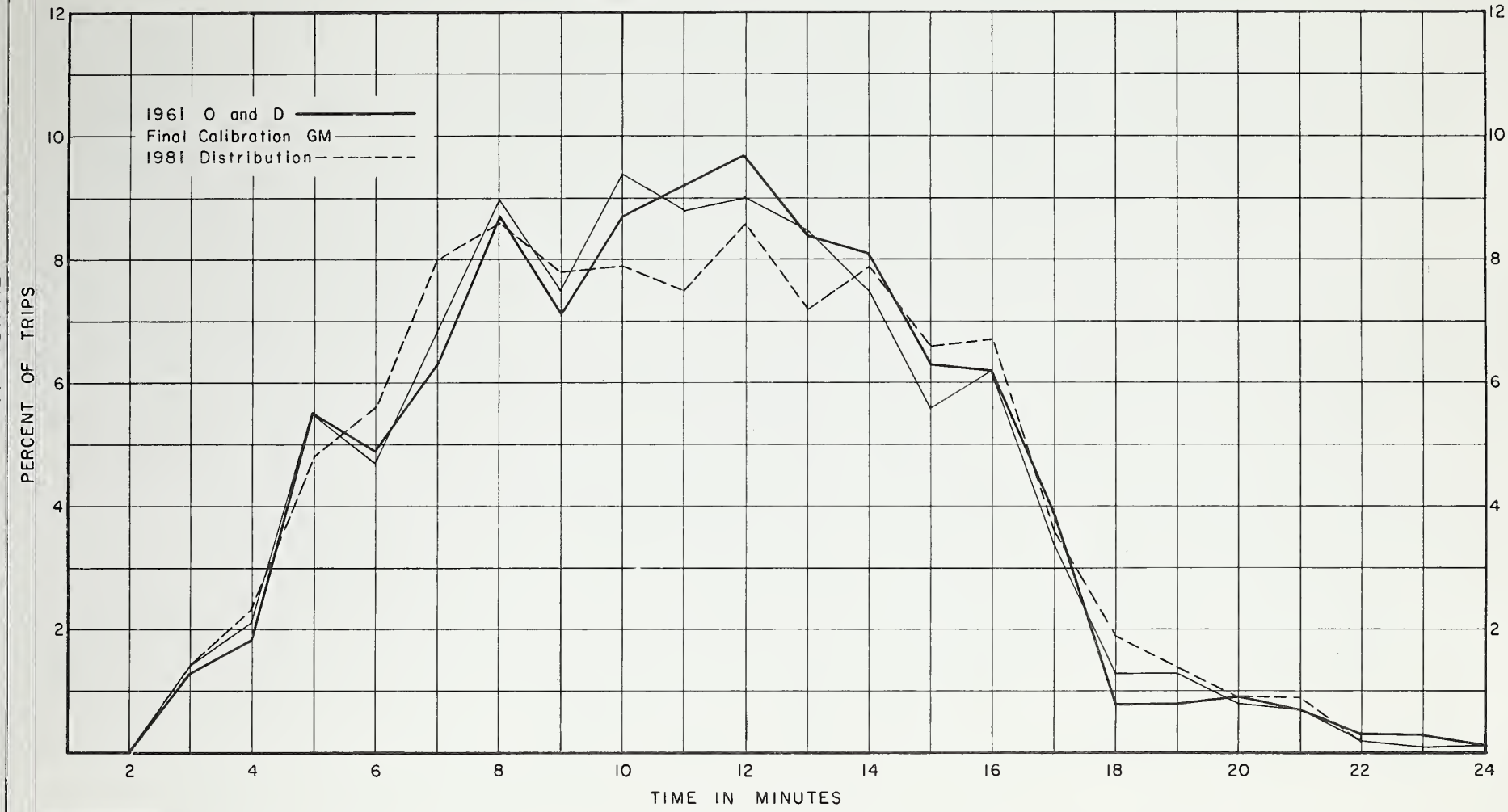


EXHIBIT 14

GREAT FALLS URBAN TRANSPORTATION STUDY

GRAVITY MODEL CALIBRATION

HOME BASED OTHER TRIPS

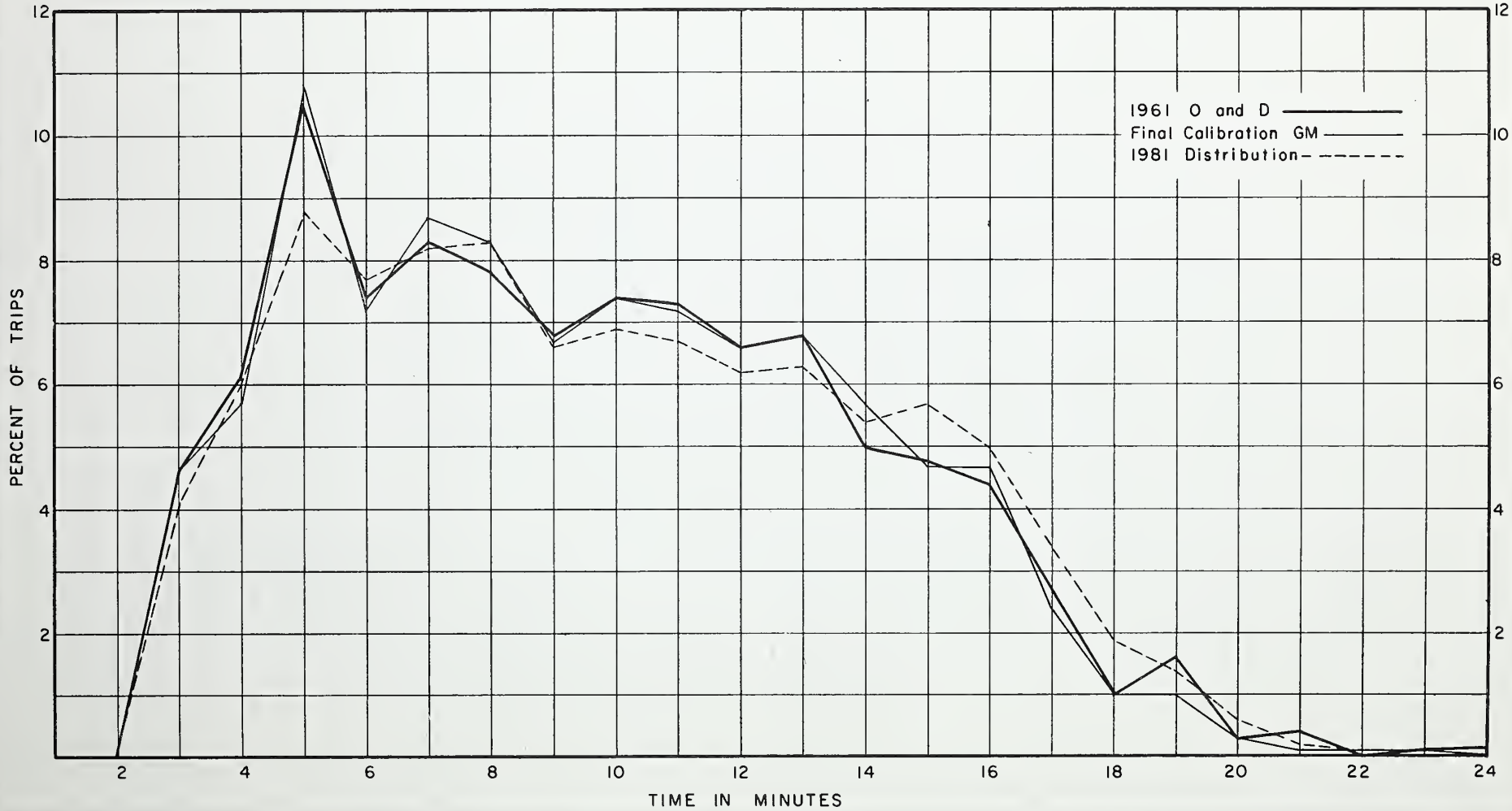


EXHIBIT 15

GREAT FALLS URBAN TRANSPORTATION STUDY
GRAVITY MODEL CALIBRATION
NON HOME BASED TRIPS
(PASSENGER CARS)

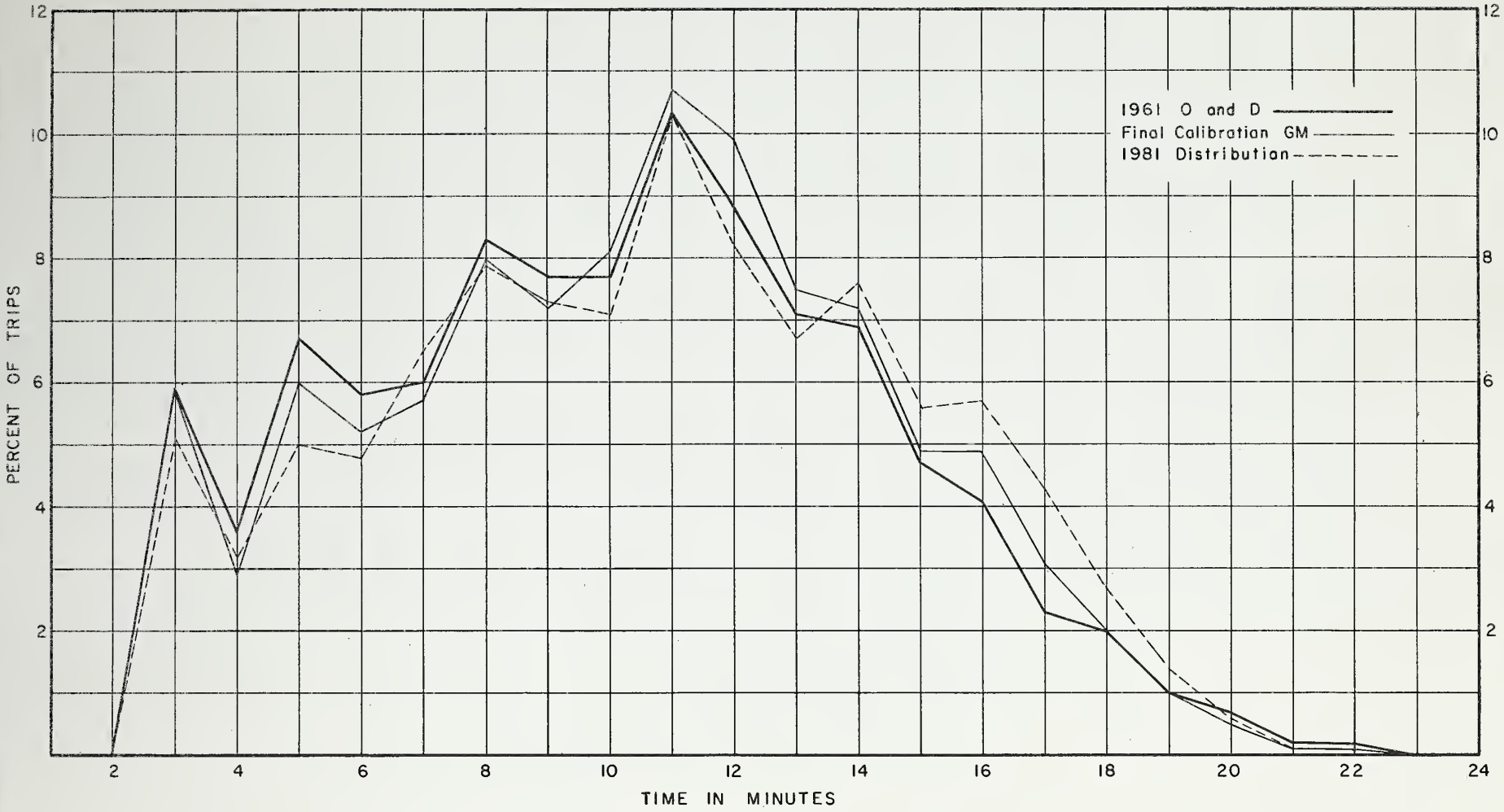


EXHIBIT 16

GREAT FALLS URBAN TRANSPORTATION STUDY
GRAVITY MODEL CALIBRATION
NON HOME BASED TRIPS
(TRUCKS)

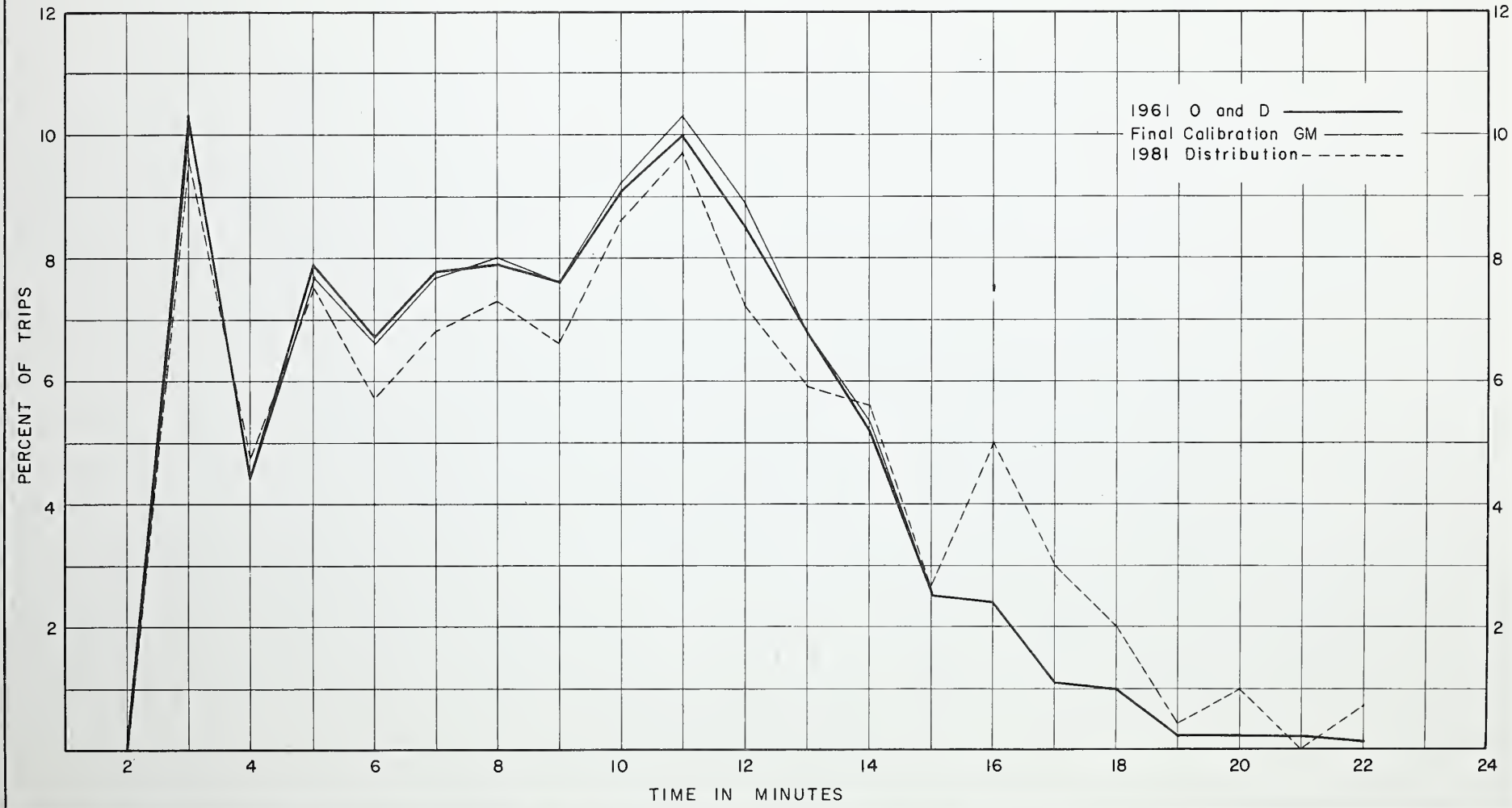


EXHIBIT 17

Missouri River Screenline Check

Gravity model trip distributions, in many cities, have indicated that topographical barriers such as rivers, mountains or railroad yards may cause some bias in the trip interchange between zones on either side of the barrier. This type of bias in the model usually results in more trips crossing the barrier than is indicated by ground counts and origin and destination surveys. Although the influence of topographical barriers on model trip distribution is not precisely known, it is believed that travel times across the barriers do not properly reflect the traffic congestion at the crossings.

In Great Falls,a test made at the Missouri River Screenline showed that the distribution of all trips by the model was about 15 percent higher on river crossings than the original origin and destination data. A further check revealed that river crossings by each trip purpose were uniformly higher than the O & D data and in the same percentage range.

To correct this discrepancy, it was decided to assign a bridge impedance time of two minutes to each bridge. The models for each trip purpose were then recalibrated to reflect this additional time and a second screenline check was made.

The results of the final screenline comparison are shown in the following tabulation:

TRIPS CROSSING MISSOURI RIVER

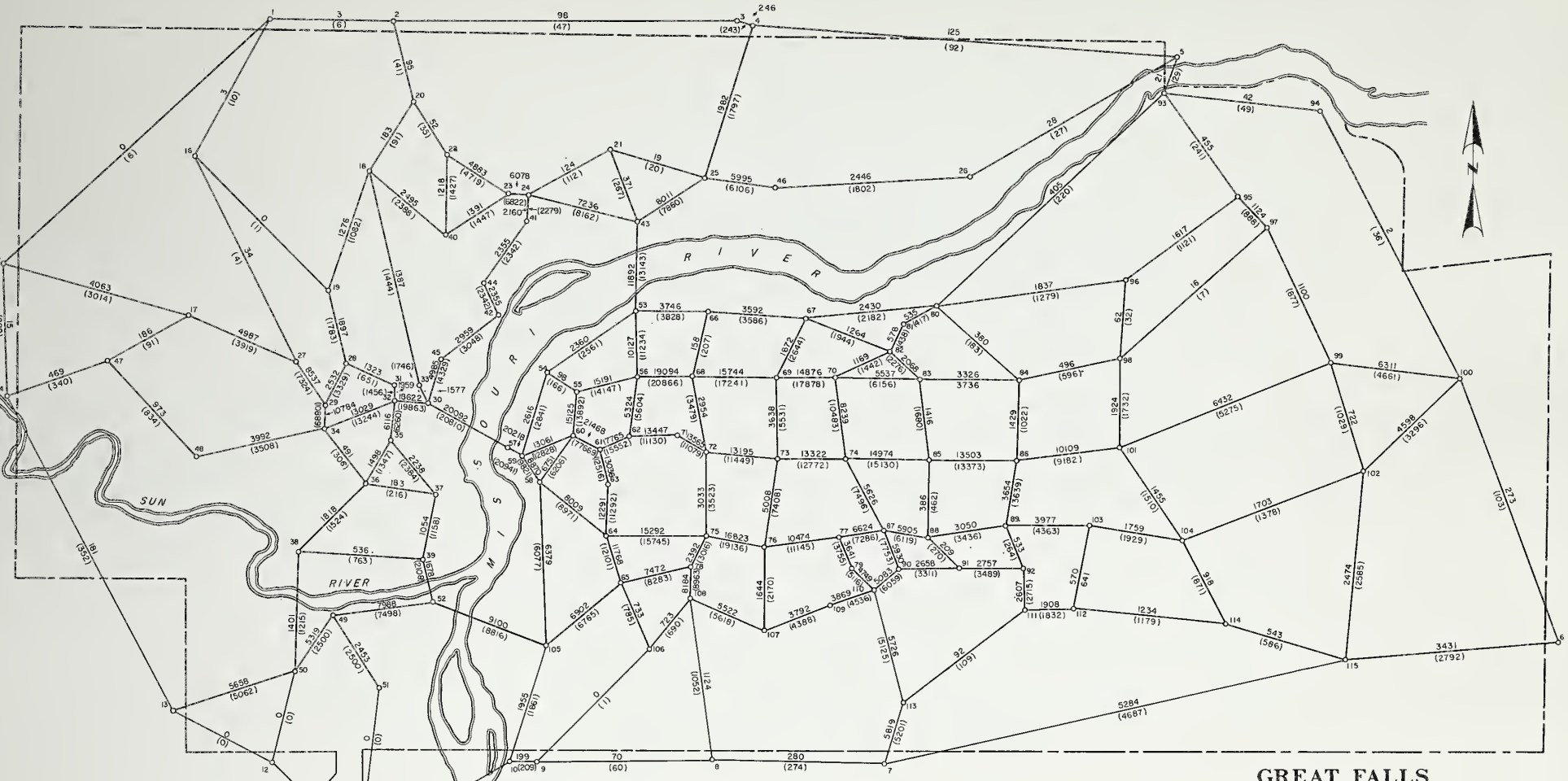
	Volume	Percent of Count	Percent of O & D
Ground Count	40,700	100.0	98.8
O & D Survey	41,201	101.2	100.0
First Calibration	47,352	116.3	114.9
Bridge Impedance Calibration	42,769	105.1	103.8

Statistical Analyses

To further test the validity of the gravity models to recreate travel patterns in the study area, the synthetic trips obtained from the models and the actual origin and destination trips were assigned to a spider web synthetic network connecting all external stations and zone centroids as shown in Exhibit 18 on page 59. Actual and synthetic trips were both assigned to this network by a computer using the minimum path method. Trip volumes of both types were accumulated on each link for comparison purposes. The results of this comparison are shown in the tabulation on page 60. This tabulation indicates that on slightly less than 70 percent of the total links that carried about 90 percent of the total assigned traffic the difference between synthetic and survey traffic values was less than 20 percent. Only 11 percent of the network links which accounted for only one percent of the total traffic movements had a volume difference of over 50 percent.

A further comparison was made between the synthetic and survey link volumes, by computing the standard deviation of error for spider web network links in the various volume groups. The standard deviation of error was then put on a proportional basis by dividing each by the average volumes thus deriving a coefficient of variation. The coefficients of variation for each volume group were finally weighted, according to the percentage of total traffic volume on all links in each volume group.

The results of this statistical comparison are shown in the tabulation on page 61. There was a general increase in the standard deviation of error from the links carrying the smaller volumes of traffic to those carrying 5,000 vehicles and over, but there was also a sharp decrease in



LEGEND

o Zone Centroid or External Station

100 1961 Origin & Destination Trips

(100) 1961 Gravity Model Trip

GREAT FALLS URBAN TRANSPORTATION STUDY

COMPARISON OF 1961 ORIGIN & DESTINATION AND SYNTHETIC TRIP ASSIGNMENT SPIDER WEB NETWORK

EXHIBIT 18

GREAT FALLS URBAN TRANSPORTATION STUDY
STATISTICAL COMPARISON OF SPIDER-WEB NETWORK LINKS
1961 SURVEY AND SYNTHETIC VOLUMES

	LINKS			SURVEY TRAFFIC VOLUME		
DIFFERENCE ON LINK (percent)	NUMBER	PERCENT	CUMULATIVE PERCENT	TOTAL VEHICLES	PERCENT	CUMULATIVE PERCENT
0 - 5	49	26.5	26.5	270,926	33.7	33.7
6 - 10	32	17.3	43.8	183,429	22.8	56.5
11 - 15	25	13.5	57.3	164,770	20.5	77.0
16 - 20	22	11.9	69.2	100,507	12.5	89.5
21 - 25	6	3.2	72.4	11,051	1.3	90.8
26 - 30	15	8.1	80.5	38,883	4.8	95.6
31 - 35	7	3.8	84.3	17,559	2.2	97.8
36 - 40	2	1.1	85.4	512	0.1	97.9
41 - 45	3	1.6	87.0	3,130	0.4	98.3
46 - 50	4	2.2	89.2	5,708	0.7	99.0
Over 50	20	10.8	100.0	7,873	1.0	100.0
TOTALS	185	100.0		804,348	100.0	

GREAT FALLS URBAN TRANSPORTATION STUDY
STATISTICAL COMPARISON OF SPIDER WEB NETWORK LINKS
1961 SURVEY AND SYNTHETIC DATA

VOLUME GROUP (Vehicles per day)	NUMBER OF LINKS	AVERAGE VOLUME	AVERAGE DIFFERENCE	STANDARD DEVIATION OF ERROR	COEFFICIENT OF VARIATION1/ (percent)	PERCENT OF TOTAL VOLUME	WEIGHTED COEFFICIENT OF VARIATION2/
0 - 499	45	143	-7	91	63.64	0.80	0.51
500 - 999	10	683	22	145	21.23	0.85	0.18
1,000 - 1,999	32	1,531	-39	341	22.27	6.09	1.36
2,000 - 2,999	19	2,485	188	394	15.86	5.87	0.93
3,000 - 3,999	13	3,595	298	665	18.50	5.81	1.07
4,000 - 4,999	6	4,711	-645	869	18.45	3.51	0.65
5,000 - 5,999	14	5,553	371	1,073	19.32	9.67	1.87
6,000 - 6,999	8	6,449	-280	828	12.84	6.41	0.82
7,000 - 7,999	3	7,565	415	765	10.11	2.82	0.29
8,000 - 8,999	6	8,308	595	1,222	14.71	6.20	0.91
9,000 - 9,999	1	9,100	-284	284	3.12	1.13	0.04
10,000 - 11,999	6	10,859	523	911	8.39	8.10	0.68
12,000 - 14,999	11	13,484	-512	1,521	11.28	18.44	2.08
15,000 and Over	11	17,767	39	1,795	10.10	24.30	2.45
TOTAL	185	4,348	684			100.00	13.84

1/ Standard deviation of error divided by average volume.
2/ Weighted according to percent of total volume.

the coefficient of variation between the actual and synthetic trips in the larger trip volume categories. The coefficient of variation ranged from about 3 to 19 percent on those links carrying over 3,000 vehicles per day, which represented about 86 percent of the total traffic volume.

The overall relative coefficient of variation when weighted according to total volume was about 14 percent. This percentage indicates the relative error in the assignment of all volume groups. It is considered reasonable in view of the fact that the variations between synthetic and survey volumes was relatively small in volume groups representing the major portion of the traffic flow.

1981 TRIP DISTRIBUTION

After the four gravity models had been calibrated and tested for accuracy on an area wide distribution of 1961 survey trips, they were then used to distribute future productions and attractions that had previously been estimated for each traffic zone. The percentage distribution of 1981 trips by time interval remained quite constant for each trip purpose as shown in the tabulations on pages 51 and 52. The average length of all trips is expected to increase about 0.4 minute by 1981 as shown in the following tabulation:

AVERAGE TRIP LENGTH - MINUTES

Type of Trip	1961 O & D	1981 Model
Home Based Work	11.10	11.22
Other Home Based	9.62	9.93
Nonhome Based	10.17	10.73
Trucks	9.07	9.77
Average - All Trips	10.08	10.48

The length of home based work trips is expected to remain about constant while both nonhome based passenger car and truck trips are expected to increase slightly by 1981.

ZONE TO ZONE TRIP MOVEMENTS

The final result of the gravity model trip distribution was the number of trips by vehicle type, produced in and attracted to each traffic zone in the study area on an average day in 1981. These trip productions and attractions were converted to actual trip volumes between zones by means of an IBM computer program.

The results of this program and the final 1981 trip volumes between zones by vehicle type are shown in Appendix Tables D-1 and E-1 located in the back of this report.

DISTRICT TO DISTRICT TRIP MOVEMENTS

In order to group the trip movements into a more significant traffic pattern, the 109 traffic zones used in the trip distribution were grouped into the same 24 districts that were used for the 1961 Origin and Destination Data. These districts approximate the planning neighborhoods previously established by the City-County Planning Board. All desire lines of travel are illustrated by traffic districts.

DESIRE LINES OF TRAVEL - 1981

Exhibits 19 through 22 on pages 65 through 69 illustrate the future desire lines of travel regardless of street network. Major traffic patterns are represented by straight line flow bands plotted to scale.

TRAVEL TO AND FROM THE CENTRAL BUSINESS DISTRICT

The major desire lines of travel to and from the central business district are shown in Exhibit 19 on page 65. Both external and internal trips are included in this Exhibit. It is expected that the central business district of Great Falls will continue to be one of the major trip generators in the area. About 14 percent of the total trips generated in the entire study area are expected to have destinations in the central business district on an average day in 1981. A comparison of trips with destinations in the central business district in 1961 and 1981 is shown in the following tabulation:

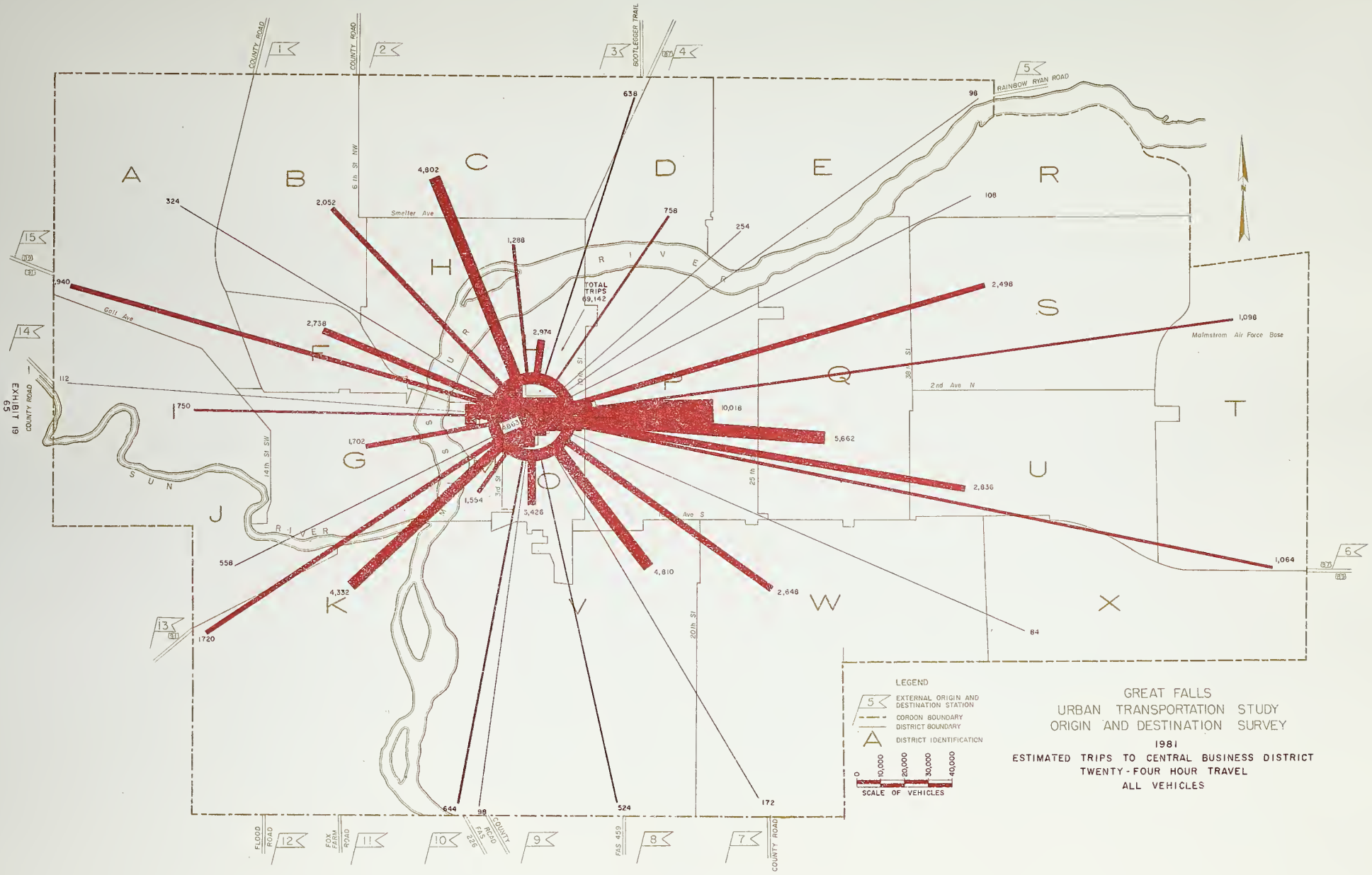
TRIPS DESTINED TO THE CENTRAL BUSINESS DISTRICT

	Destinations to CBD		Total Destinations		Percent to CBD	
	1961	1981	1961	1981	1961	1981
External	2,080	3,505	10,840	20,718	19.2	16.9
Internal	23,394	33,500	131,337	248,600	17.8	13.5
Total Trips	25,474	37,005	142,177	269,318	17.9	13.7

THROUGH - NONSTOP TRAVEL

Exhibit 20 on page 66 illustrates the estimated amount of through nonstop travel between external stations on an average day in 1981. Although this segment of travel is expected to increase from 932 to 2,672 trips by 1981, it will still amount to only seven percent of the total external travel and less than one percent of all travel within the study area.

Nonstop truck trips between external stations will amount to about 272 per day by 1981 or 10 percent of the total through trips.


GREAT FALLS
URBAN TRANSPORTATION STUDY
ORIGIN AND DESTINATION SURVEY
1981
ESTIMATED TRIPS TO CENTRAL BUSINESS DISTRICT
TWENTY-FOUR HOUR TRAVEL
ALL VEHICLES
LEGEND
EXTERNAL ORIGIN AND DESTINATION STATION
CORDON BOUNDARY
DISTRICT BOUNDARY
DISTRICT IDENTIFICATION
SCALE OF VEHICLES
0
10,000
20,000
30,000
40,000
TOTAL TRIPS 69,142
A
B
C
D
E
R
S
T
U
X
W
V
K
J
G
F
H
Q
P
O
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
COUNTY ROAD
BOOTLEGGER TRAIL
RAINBOW RYAN ROAD
6th St NW
Smelter Ave
Golf Ave
14th St SW
3rd St
10th St
38th St
2nd Ave N
Ave S
25th
20th St
Malmstrom Air Force Base
SUN RIVER
MISSOURI RIVER
FLOOD ROAD
FOX FARM ROAD
COUNTY ROAD
FAS 225
FAS 459
COUNTY ROAD
EXHIBIT 19
65
324
2,052
4,802
638
758
1,288
2,974
254
98
108
2,498
1,098
1,940
2,738
112
1,750
1,702
4,863
10,018
5,662
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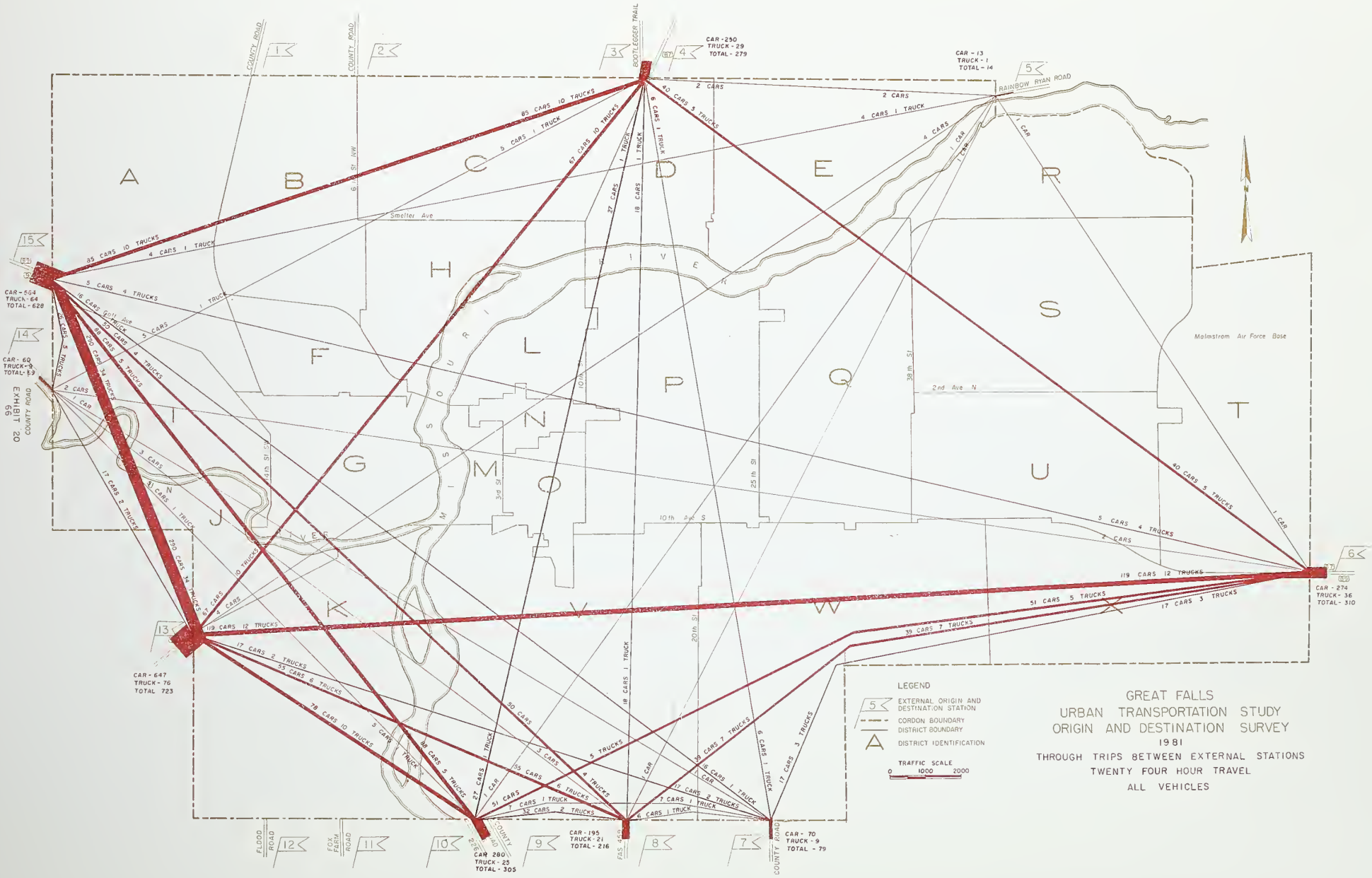
2,648
558
4,332
1720
84
644
98
524
172


GREAT FALLS
URBAN TRANSPORTATION STUDY
ORIGIN AND DESTINATION SURVEY
1981
THROUGH TRIPS BETWEEN EXTERNAL STATIONS
TWENTY FOUR HOUR TRAVEL
ALL VEHICLES
LEGEND
EXTERNAL ORIGIN AND DESTINATION STATION
CORDON BOUNDARY
DISTRICT BOUNDARY
DISTRICT IDENTIFICATION
TRAFFIC SCALE
0 1000 2000
A B C D E F G H I J K L M N O P Q R S T U V W X
COUNTY ROAD
6th St NW
BOOTLEGGER TRAIL
RAINBOW RYAN ROAD
Smelter Ave
Malmstrom Air Force Base
2nd Ave N
10th Ave S
38th St
25th St
20th St
10th St
3rd St
14th St SW
FLOOD ROAD
FOX FARM ROAD
FAS 425
CAR - 250
TRUCK - 29
TOTAL - 279
CAR - 13
TRUCK - 1
TOTAL - 14
CAR - 564
TRUCK - 64
TOTAL - 628
CAR - 60
TRUCK - 9
TOTAL - 69
CAR - 647
TRUCK - 76
TOTAL 723
CAR - 274
TRUCK - 36
TOTAL - 310
CAR 280
TRUCK - 25
TOTAL - 305
CAR - 195
TRUCK - 21
TOTAL - 216
CAR - 70
TRUCK - 9
TOTAL - 79
35 CARS 10 TRUCKS
4 CARS 1 TRUCK
85 CARS 10 TRUCKS
5 CARS 1 TRUCK
67 CARS 10 TRUCKS
40 CARS 3 TRUCKS
2 CARS
4 CARS 1 TRUCK
40 CARS 5 TRUCKS
1 CAR
119 CARS 12 TRUCKS
51 CARS 5 TRUCKS
17 CARS 3 TRUCKS
39 CARS 7 TRUCKS
6 CARS 1 TRUCK
17 CARS 3 TRUCKS
78 CARS 10 TRUCKS
3 CARS 1 TRUCK
50 CARS
55 CARS
51 CARS
7 CARS 1 TRUCK
32 CARS 2 TRUCKS
6 CARS 1 TRUCK
17 CARS 2 TRUCKS
7 CARS 1 TRUCK
27 CARS 1 TRUCK
18 CARS 1 TRUCK
5 CARS 4 TRUCKS
16 CARS 1 TRUCK
20 CARS
68 CARS 5 TRUCKS
230 CARS 34 TRUCKS
17 CARS 2 TRUCKS
81 CARS 1 TRUCK
295 CARS 34 TRUCKS
67 CARS
4 CARS
10 TRUCKS
2 CARS
1 CAR
3 CARS
5 CARS 4 TRUCKS
2 CARS
1 CAR
1 CAR
4 CARS
1 CAR
1 CAR
1 CAR

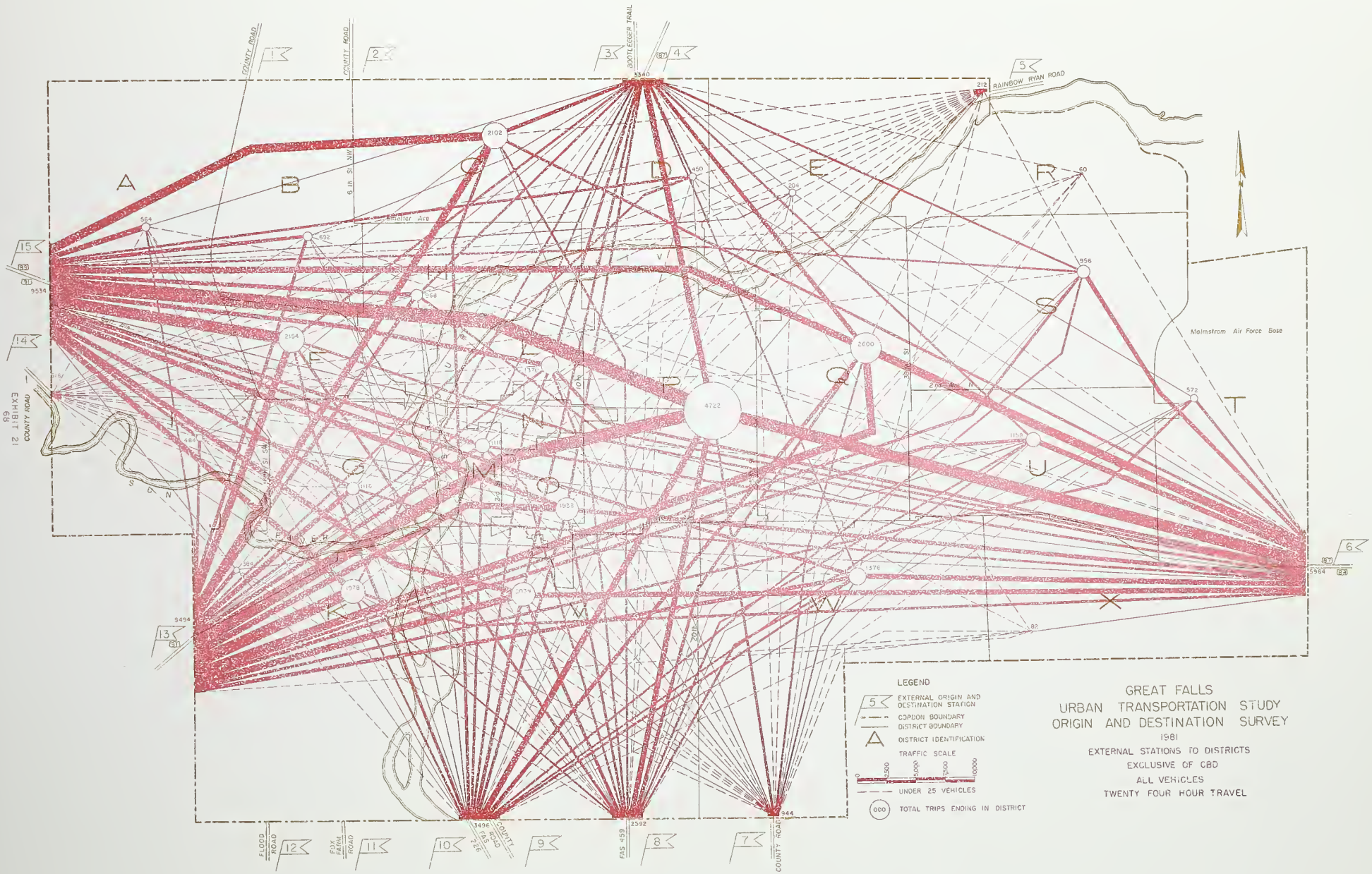
EXTERNAL TRAVEL TO INTERNAL DISTRICTS

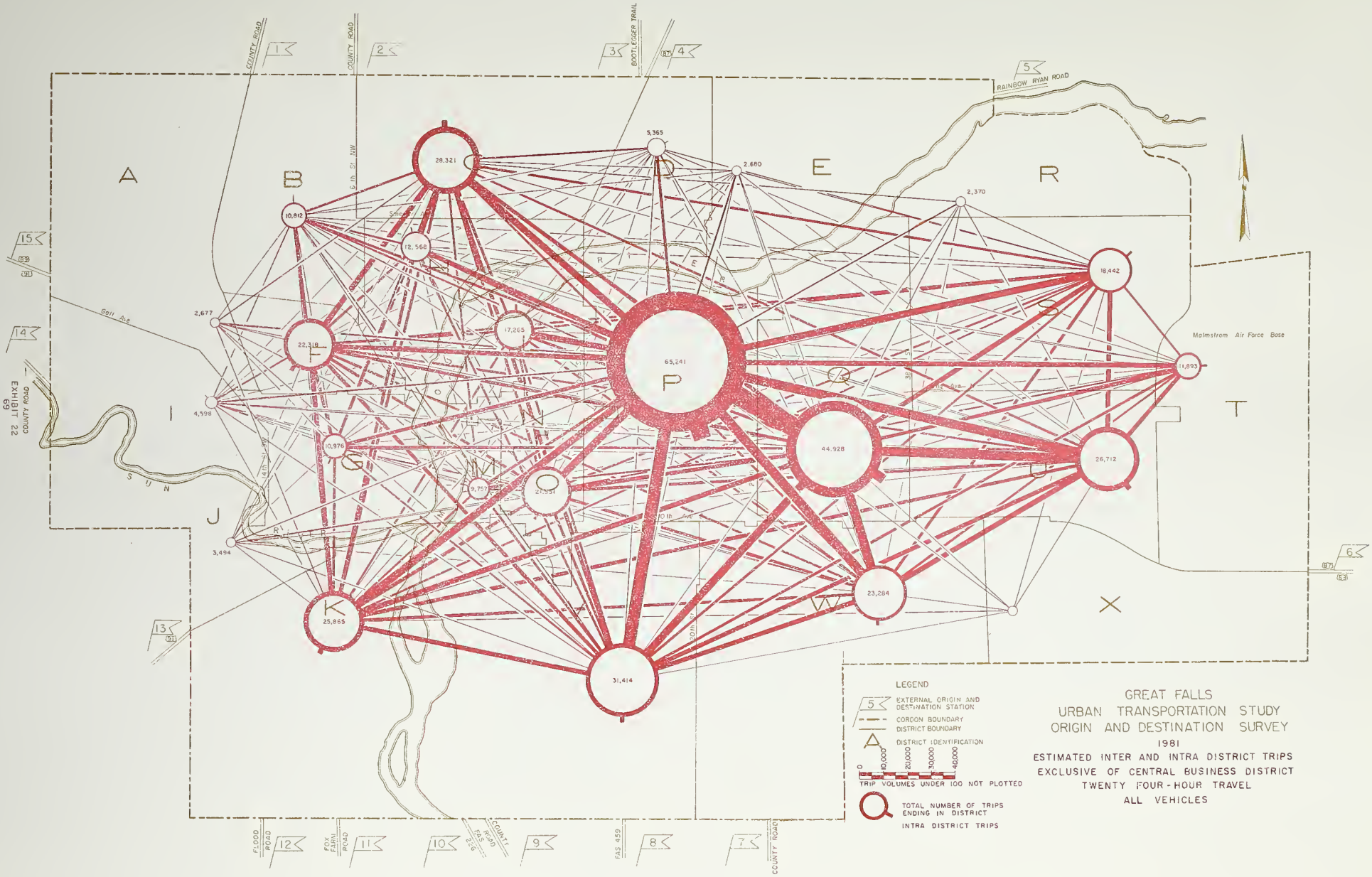
Estimated trips between external stations and all districts, exclusive of the business district, are presented in Exhibit 21 on page 68 . A total 1981 daily volume of 32,587 trips per day are represented by flow bands in this Exhibit. Trip volumes of less than 25 trips per day are shown as a dashed single line.

INTERNAL TRIPS BETWEEN DISTRICTS

Future trips that will be made by all vehicles between and within all districts, except the central business district, are illustrated in Exhibit 22 on page 69 . In the interest of clarity, trip volumes of less than 100 vehicles per day are not plotted. It is expected that inter-district and intra-district trips, exclusive of the central business district, will account for about 75 percent of the total travel within the study area on an average day in 1981.

The predominant flow of traffic will still be in an east-west direction, as evidenced by the trip desire lines.


GREAT FALLS
URBAN TRANSPORTATION STUDY
ORIGIN AND DESTINATION SURVEY
1981
EXTERNAL STATIONS TO DISTRICTS
EXCLUSIVE OF CBD
ALL VEHICLES
TWENTY FOUR HOUR TRAVEL
LEGEND
EXTERNAL ORIGIN AND DESTINATION STATION
CORDON BOUNDARY
DISTRICT BOUNDARY
DISTRICT IDENTIFICATION
TRAFFIC SCALE
UNDER 25 VEHICLES
TOTAL TRIPS ENDING IN DISTRICT
Malmstrom Air Force Base
BOOTLEGGER TRAIL
RAINBOW RYAN ROAD
COUNTY ROAD
FLOOD ROAD
FOX FARM ROAD
FAS 459
EXHIBIT 21
68


GREAT FALLS
URBAN TRANSPORTATION STUDY
ORIGIN AND DESTINATION SURVEY
1981
ESTIMATED INTER AND INTRA DISTRICT TRIPS
EXCLUSIVE OF CENTRAL BUSINESS DISTRICT
TWENTY FOUR-HOUR TRAVEL
ALL VEHICLES
LEGEND
EXTERNAL ORIGIN AND DESTINATION STATION
CORDON BOUNDARY
DISTRICT BOUNDARY
DISTRICT IDENTIFICATION
0 10,000 20,000 30,000 40,000
TRIP VOLUMES UNDER 100 NOT PLOTTED
TOTAL NUMBER OF TRIPS ENDING IN DISTRICT
INTRA DISTRICT TRIPS
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
65,241
44,928
31,414
28,321
26,712
25,865
23,284
22,319
18,442
17,265
12,568
11,893
10,812
10,976
9,757
27,931
5,365
4,598
3,494
2,680
2,677
2,370
Malmstrom Air Force Base
Gall Ave
Sun River
COUNTY ROAD
BOOTLEGGER TRAIL
RAINBOW RYAN ROAD
FLOOD ROAD
FOX FARM ROAD
FAS 459
EXHIBIT 22
69

The Demand for Future Parking Space

THE DEMAND FOR FUTURE PARKING SPACE

In the first volume of the Great Falls Urban Transportation Study, the inventory, usage and present demand for parking space in the central business district were all examined to determine whether additional spaces were required in 1961. Since the parking survey was made in conjunction with an area-wide transportation study in which travel was predicted for 20 years in the future, the probable parking demand in the central business district for 1981 can also be determined.

The central business district as delimited by the parking survey is shown in Exhibit 23 on page 73. It is comprised of traffic zones 7307, 7308,7309, 7310, and 7406. The Origin and Destination Survey of 1961 indicated 25,474 trips had destinations in this area during an average 24-hour period. The parking survey of the same year indicated 20,756 vehicles parked within the area during the period of 10:00 a.m. to 6:00 p.m. These two surveys are in reasonable agreement considering the fact that the parking survey was conducted during the month of July and the Origin and Destination Survey extended over a period of from June through September.

The 1981 traffic projection of trips with destinations in the central business district indicates a total of 37,005 trips or an increase of about 45% over an average day in 1961. This increase is based on the best estimates available of future land use and employment. It also takes into consideration the probable continued dispersion of shopping trips to local shopping centers throughout the urban area.

An increase of 45% in trips with destinations in the central business district, indicates a total volume of about 30,000 vehicles will park in

EXHIBIT 23
13

this area during the hours of 10:00 a.m. to 6:00 p.m. of an average weekday in 1981. If parking characteristics remain stable for the 20-year period, about 40% of the motorists parked in the area or 12,000, will have primary destinations in the 10 block core area shown in Exhibit 23 on page 73.

It is estimated that the demand for relatively long term parking of three hours and over will increase more rapidly than will the shorter term parking of under three hours. The average time parked should also increase slightly to about 1 hour and 11 minutes from the present 1 hour and 8 minutes at all facilities. These estimates are based on the assumption that short term parking demand (39 minutes)for the purpose of shopping will not increase as rapidly as the future demand for long term parking space that will be created by work and business purposes.

The estimated average time parked and percent of space hours used by trip purpose in 1961 and 1981 is shown in the following tabulation.

TRIP PURPOSE	PERCENT OF TOTAL PARKERS		TIME PARKED HOURS		PERCENT OF SPACE HOURS USED	
	1961	1981	1961	1981	1961	1981
Shopping	26.8	25.0	0.65	0.65	15.3	13.7
Business	22.4	23.0	0.54	0.54	10.7	10.5
Work	14.4	17.0	2.87	2.87	36.5	41.2
Others	36.4	35.0	1.17	1.17	37.5	34.6
All Purposes	100.0	100.0	1.14	1.18	100.0	100.0

The estimated number of parkers in the central business district and the space hours that will be required to satisfy the demand for parking between the hours of 10:00 a.m. and 6:00 p.m. on an average weekday in 1981 is tabulated as follows:

TRIP PURPOSE	PERCENT OF TOTAL PARKERS	NUMBER OF PARKERS	AVERAGE TIME PARKED-HOURS	SPACE HOURS REQUIRED
Shopping	25	7,500	0.65	4,800
Business	23	6,900	0.54	3,700
Work	17	5,100	2.87	14,600
Others	35	10,500	1.17	12,300
All Purposes	100	30,000	1.18	35,400

PARKING SPACES REQUIRED IN ENTIRE CENTRAL BUSINESS DISTRICT

Approximately 4,900 parking spaces will be necessary to supply the 35,400 space-hours that will be used during the eight hours between 10:00 a.m. and 6:00 p.m. in 1981. This estimate assumes a practical space-hour efficiency of 90 percent for all facilities.

The 1961 inventory of parking space in the entire central business district indicated that there were 2,252 spaces at the curb and 2,680 spaces in offstreet lots and garages. The 1961 total of 4,932 parking spaces produced 35,530 practical space-hours or about the same number that will be required on an average weekday in 1981.

Theoretically then, there should be a very small surplus of parking spaces in the entire central business district by 1981, providing the motorist is willing to walk an unrealistic distance from the fringe areas to his destination in or near the core of the central business district. If, however, the supply of parking spaces is balanced with

the demand within a reasonable walking distance, there definitely will be a shortage of parking spaces in and near the core of the central business district by 1981.

CORE AREA - SUPPLY AND DEMAND

The core area of the central business district as shown in Exhibit 23 on page 73 consists of a 10 block area bounded by First Avenue North, Seventh Street, First Avenue South and Second Street. This area was the primary destination of about 40 percent of the motorists who parked in the entire central business district, yet it contained only about 20 percent of the total available parking spaces in 1961.

The demand for parking space in the core area by trip purpose for 1961 and 1981 is compared in the tabulation on page 77. This tabulation indicates that there will be a parking demand for about 15,000 space-hours or 2,000 parking spaces in the core area during an eight hour period by 1981. The present core area supply of parking spaces is about 950 which when compared to the demand, leaves an unbalanced shortage of about 1,050 parking spaces by 1981. When the supply and demand for parking space is balanced within a reasonable walking distance of 350 feet, there will still be an apparent shortage of about 950 spaces in an eight hour period of an average weekday in 1981.

This shortage is expected to occur in the same general areas as were defined in 1961, with the exception of block 24 on Central Avenue between Park Drive and Second Street. The addition of 34 metered spaces in an off-street parking lot in this block, combined with the general shifting of the parking demand to the east, should balance the supply and demand in the western sector of the core area. Blocks showing a deficiency of parking

THE DEMAND FOR AND USAGE OF PARKING SPACE
IN THE CORE AREA BY TRIP PURPOSE
1961 - 1981

PARKING SPACE DEMAND
CORE AREA 10:00 a.m. - 6:00 p.m.

	NUMBER OF PARKERS				SPACE HOURS OF DEMAND				AVE. TIME PARKED (HOURS)	
	1961		1981		1961		1981			
TRIP PURPOSE	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	1961	1981
Shopping	3644	44.3	4800	40.0	3153.3	32.3	4128	27.0	0.86	0.86
Business	1578	19.2	2520	21.0	1220.7	12.5	1940	13.0	0.77	0.77
Work	929	11.3	1680	14.0	3338.8	34.2	6031	40.0	3.59	3.59
Others	2072	25.2	3000	25.0	2059.9	21.0	2970	20.0	0.99	0.99
All Purposes	8223	100.0	12,000	100.0	9772.7	100.0	15,069	100.0	1.13	1.26

PARKING SPACE USAGE 1961
CORE AREA 10:00 a.m. - 6:00 p.m.

TRIP PURPOSE	NUMBER OF PARKERS	PERCENT	SPACE HOURS USED	PERCENT	AVE. TIME PARKED (HOURS)
Shopping	3118	48.0	2267.0	38.1	0.73
Business	1160	17.8	816.1	13.7	0.70
Work	559	8.6	1374.7	23.0	2.46
Others	1663	25.6	1501.0	25.2	0.90
All Purposes	6500	100.0	5948.8	100.0	0.92

space within a walking distance of 350 feet are shown in Exhibit 24 on page 79 and are detailed in the following tabulation:

SURVEY BLOCK NUMBER	STREET	BETWEEN	NUMBER OF ADDITIONAL SPACES REQUIRED
26	Central Ave.	Third & Fourth Streets	200
27	Central Ave.	Fourth & Fifth Streets	220
28	Central Ave.	Fifth & Sixth Streets	350
29	Central Ave.	Sixth & Seventh Streets	50
74	Third Street	1st Ave. North & Central	130
	ADDITIONAL SPACES REQUIRED - 1981		950 *

* Includes 515 spaces required in 1961.

In conclusion, it is estimated that about 950 additional parking spaces will be required in the central business district, to satisfy the expected demand for parking on a normal day in 1981. These spaces should be provided in the core area as shown in Exhibit 24 on page 79. The additional 950 spaces represent an increase of 19 percent over the 4, 932 spaces available in the survey area in 1961.

CONSTRUCTION PRIORITIES

Due to the relatively high cost of land in the core area, it will probably be necessary to construct multi-level parking garages to satisfy the future demand for parking space. The numbers 1 through 8 on Exhibit 24 on the opposite page indicate the general priorities for locations of off-street parking facilities. The five shaded areas on this same exhibit indicate the areas of deficient parking space.

It should be stressed that these location priorities are general and are not intended as a rigid guide for future development of off-street parking. It is strongly recommended, however, that future

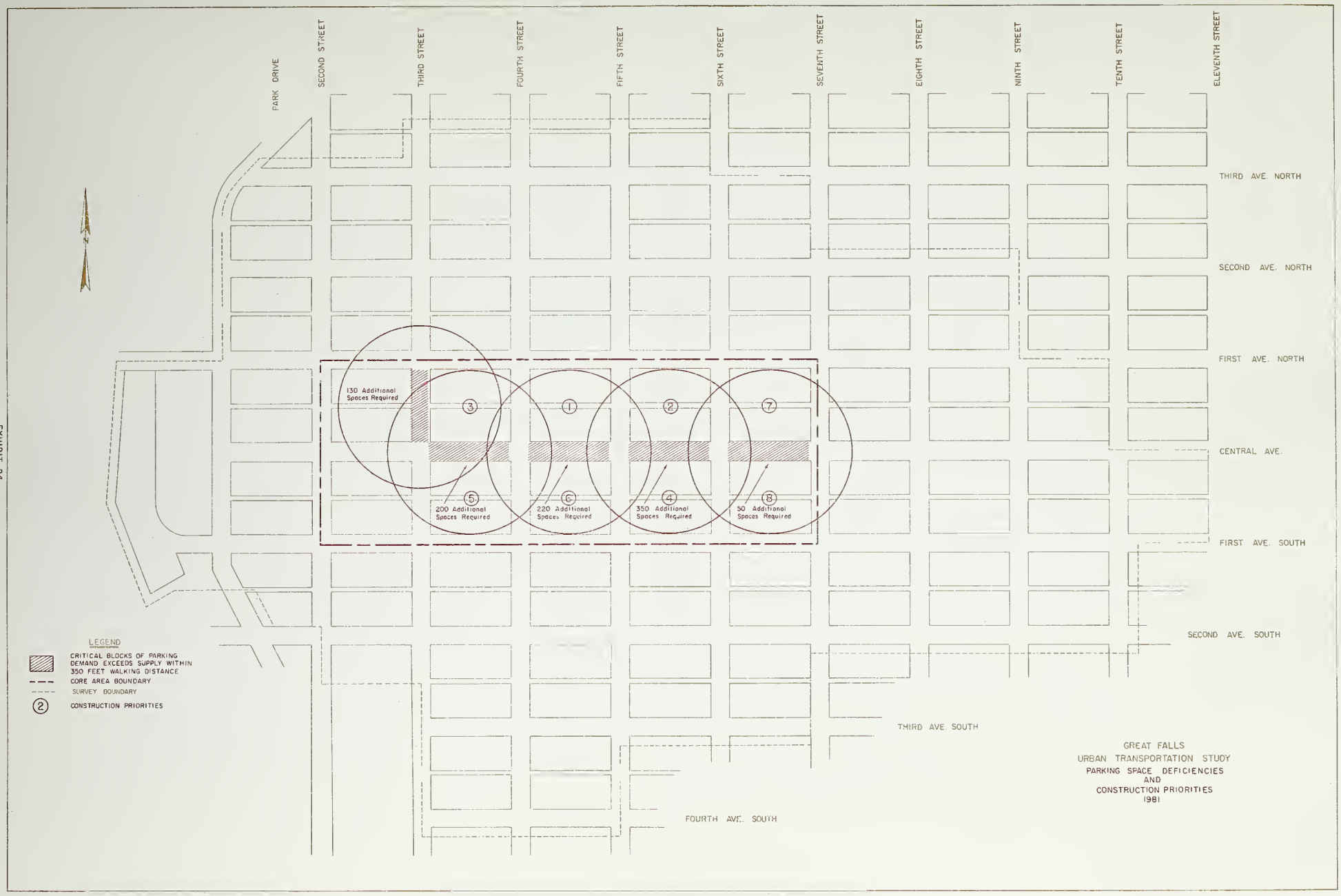


EXHIBIT 24
79

parking facilities be developed in the core area within a reasonable walking distance of the apparent shortages.

LONG TERM PARKING SPACES FOR WORKERS

The 1961 summary of parking space usage by trip purpose on page 77 indicates that less than 9 percent of the total parkers in the core area were employees, but they parked an average of 2.46 hours and used about 23 percent of the available space-hours in the area. If these workers can be persuaded to park outside the core area about 1,375 space-hours of parking can be made available for an additional 1,700 shoppers, who parked an average of only 0.73 hours.

In order to make available as much parking space as possible for shoppers, it is recommended that four metered lots shown in Exhibit 25 on page 81 be converted to a monthly rental system that should attract long term parkers. These lots are now operated by the city and are located in the fringe area too far from the core to attract short term parkers.

The following summary of capacity, meter revenue and number of cars parked on an average weekday in 1961 is an indication of the feasibility of renting spaces by the month in these lots.

FRINGE AREA METERED PARKING LOTS
RECOMMENDED FOR MONTHLY RENTALS

LOT NUMBER CITY	SURVEY	NUMBER OF SPACES	CARS PARKED 10:00 a.m.-6:00 p.m.	ANNUAL REVENUE PER SPACE	MONTHLY REVENUE PER SPACE
3	48-4	48	86	$ 82.52	$6.88
6	20-5	74	96	110.93	9.24
7	36-4	40	68	102.50	8.54
8	60-6 & 7	68	55	13.97	1.16
TOTAL		230	305	$ 74.87	$6.24

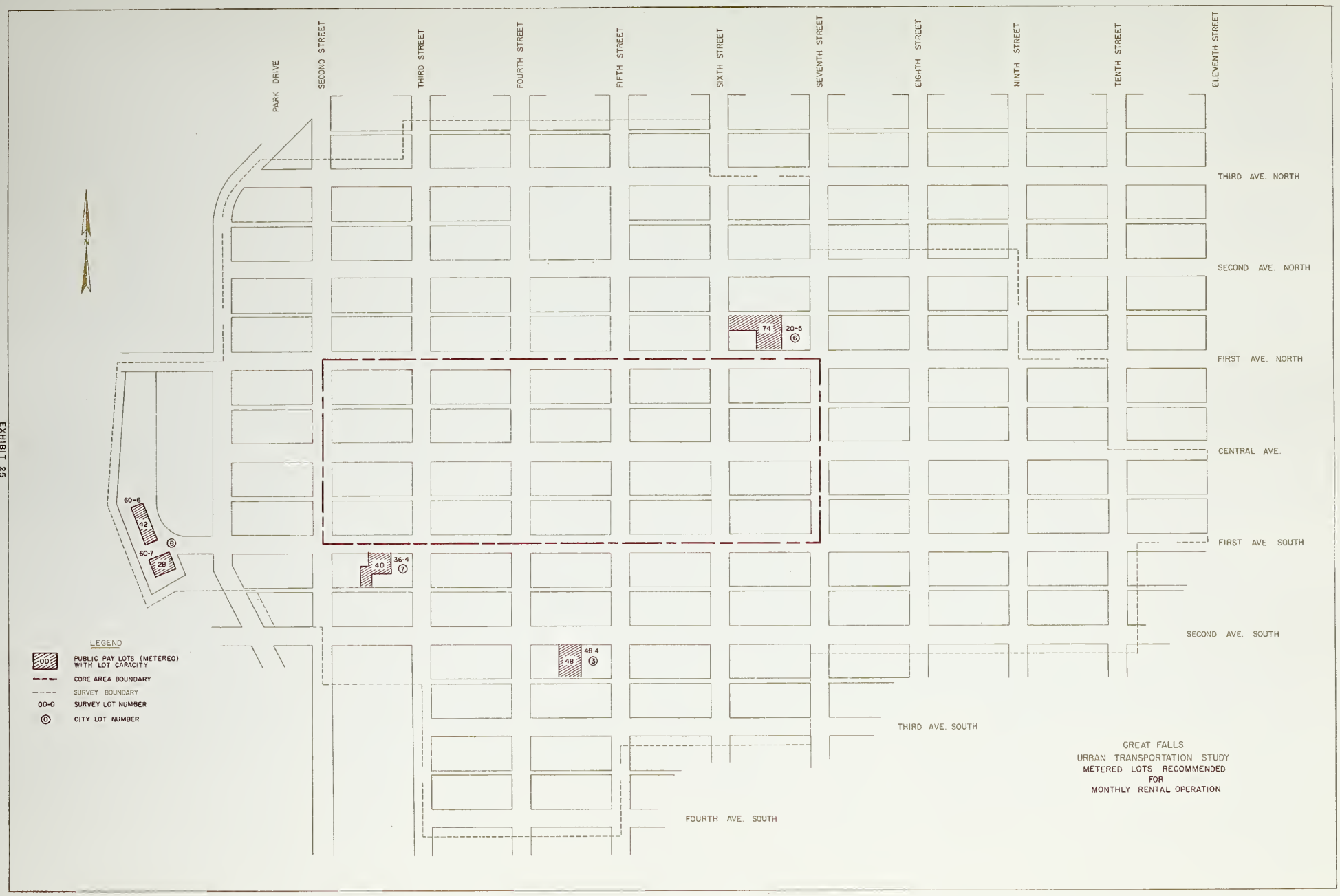


EXHIBIT 25
81

The preceding tabulation indicates that it would be possible to rent spaces in these lots at a monthly rental of from 7 to 10 dollars per space and still obtain about the same amount of revenue as with the present meters.

It is recommended that this plan be given a trial and that the employers encourage their employees to park in these lots to provide more space for shoppers.

THE ECONOMICS OF PARKING GARAGES

At current prices, the construction costs of a ramp type open air parking garage will range from $1,800 to $2,200 per car space. To this cost can be added the price of the land which will vary from $1,400 to $2,100 per car space in the typical four or five story parking garage. The total cost per space in a parking garage will, therefore, range from $3,200 to $4,300 for land and building construction. Annual operating expenses of from $70 to $250 per car space should be added to these initial costs, to determine whether a facility is economically feasible.

If it is assumed that, land and building costs will average $3,600 per car space and operating costs will be about $100 per space, then the annual revenue must average about $355 per space just to amortize the investment over a 25 year period at five percent interest. If any profit is to be realized on the investment, revenue must be greater than $355 per car space. Garage construction must, therefore, be undertaken only at the most convenient locations and the parking rates must be kept as low as possible to encourage short term parkers.

SUMMARY OF RECOMMENDATIONS

There will be a shortage of about 950 parking spaces in the core of the central business district by 1981. These spaces will probably have to be provided by the construction of multi-level parking garages in or near the areas shown in Exhibit 24 on page 79. Potential sites for future parking facilities should probably be acquired as soon as possible. These sites can be operated as lots and later developed into multi-level structures. Stage construction can be utilized on the buildings to add additional levels of parking as required.

Some of the metered lots, now operated by the city, are too far from the parking demand to be of much value to the short term parker. It is, therefore, recommended that four of these lots shown in Exhibit 25 on page 81 be converted to a monthly rental basis to encourage the long term worker-parker. If the proposed change to a monthly rental is effective in moving long term parkers from the core area to vacant spaces in the four lots, it will be possible to provide about 200 additional spaces for short term parkers in the core area. The net parking deficiency in the core area for 1981 will then be reduced from 950 to about 750 spaces.

Future Trip Assignment and 1981 Traffic Volumes

FUTURE TRIP ASSIGNMENT AND 1981 TRAFFIC VOLUMES

TRAFFIC ASSIGNMENT PROCEDURES

A motorist usually considers time as the most important factor in selecting a route of travel through an urban area. Computer programs that use this theory have been developed to assign traffic to a major street system.

Traffic assignment by computer is, therefore, based primarily on actual traveltime between points of origin and destination in an urban area. It involves coding average speeds and distances on a network of streets, preparing the origin and destination trip data for computer application and using computer programs to distribute the trip volumes on the various links of the street network. In this process, the computer actually tests all possible routes between any two points in the study area and selects the route with the least traveltime. All vehicular trips within the study area are assigned to a minimum path between each origin and destination and trip volumes are accumulated on each intermediate link. The accumulation of future trip volumes on each link of an urban street network is used to determine how well each link can be expected to handle anticipated traffic volumes and what improvements may be necessary to the present street system. Proposed improvements may be added to the street system to determine the effect they will have on the overall future traffic patterns.

THE 1981 COMMITTED NETWORK

The first future traffic assignment was made to the designated 1961 major street system, plus those street sections that were either completed

since 1961 or presently in the advanced planning stage. Street sections in this category that were added to the 1961 system are as follows:

1. The Urban Section of Interstate Route 15
2. The Northwest Bypass - FAS 521
3. The 15th Street Bridge and the one-way couplet of 14th and 15th Streets.
4. The one-way couplet of 5th and 6th Streets.

After the initial traffic assignment was completed, a traffic capacity analysis was made on those links that appeared overloaded and at the intersections that were approaching practical traffic capacity in 1961. Various improvements to the committed system were then added and future traffic volumes were reassigned. This process was continued until a major street network was developed that will adequately handle the 1981 traffic volumes in the most economical manner. A total of eight traffic assignments were necessary to develop the final 1981 major street network shown in Exhibit 26 on page 88.

FUTURE TRAFFIC VOLUMES

The estimated 1981 traffic flow on the final major street network is shown in Exhibit 27 on page 89. This traffic flow map was prepared from the final computer assignment of trip volumes to the various links of the major street network. The maximum traffic volume of about 38,000 vehicles is expected to occur on 10th Avenue South in the vicinity of the Warden Bridge. The predominant traffic flow will still be in an east-west direction but will not be as pronounced as it was in 1961.

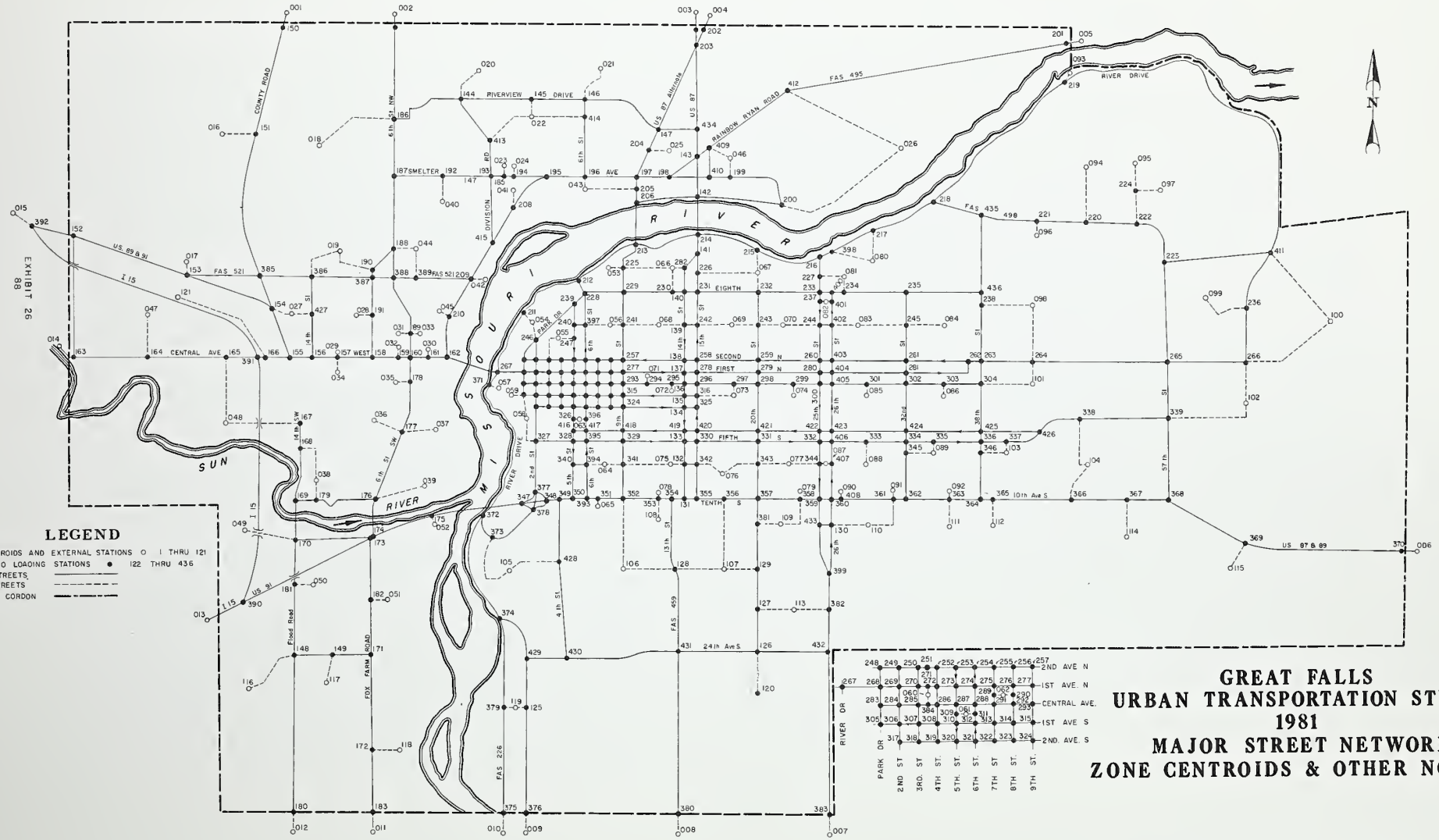

LEGEND
ZONE CENTROIDS AND EXTERNAL STATIONS O 1 THRU 121
NODES AND LOADING STATIONS ● 122 THRU 436
MAJOR STREETS
LOCAL STREETS
EXTERNAL CORDON
SUN RIVER
MISSOURI RIVER
RIVER DRIVE
RIVERVIEW DRIVE
SMELTER AVE
DIVISION RD
COUNTY ROAD
CENTRAL AVE WEST
SECOND
FIRST
EIGHTH
FIFTH
TENTH S
10th Ave S
24th Ave S
RAINBOW RIAN ROAD
FAS 495
FAS 435
FAS 521
FAS 459
FAS 226
US 89 & 91
US 87 & 89
US 87
US 87 Alternate
I 15
FOX FARM ROAD
Flood Road
PARK DR
2ND ST
3RD. ST
4TH ST.
5TH. ST.
6TH ST
7TH ST
8TH ST.
9TH ST.
2ND AVE N
1ST AVE. N
CENTRAL AVE.
1ST AVE S
2ND. AVE S
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EXHIBIT 26
GREAT FALLS
URBAN TRANSPORTATION STUDY
1981
MAJOR STREET NETWORK
ZONE CENTROIDS & OTHER NODES

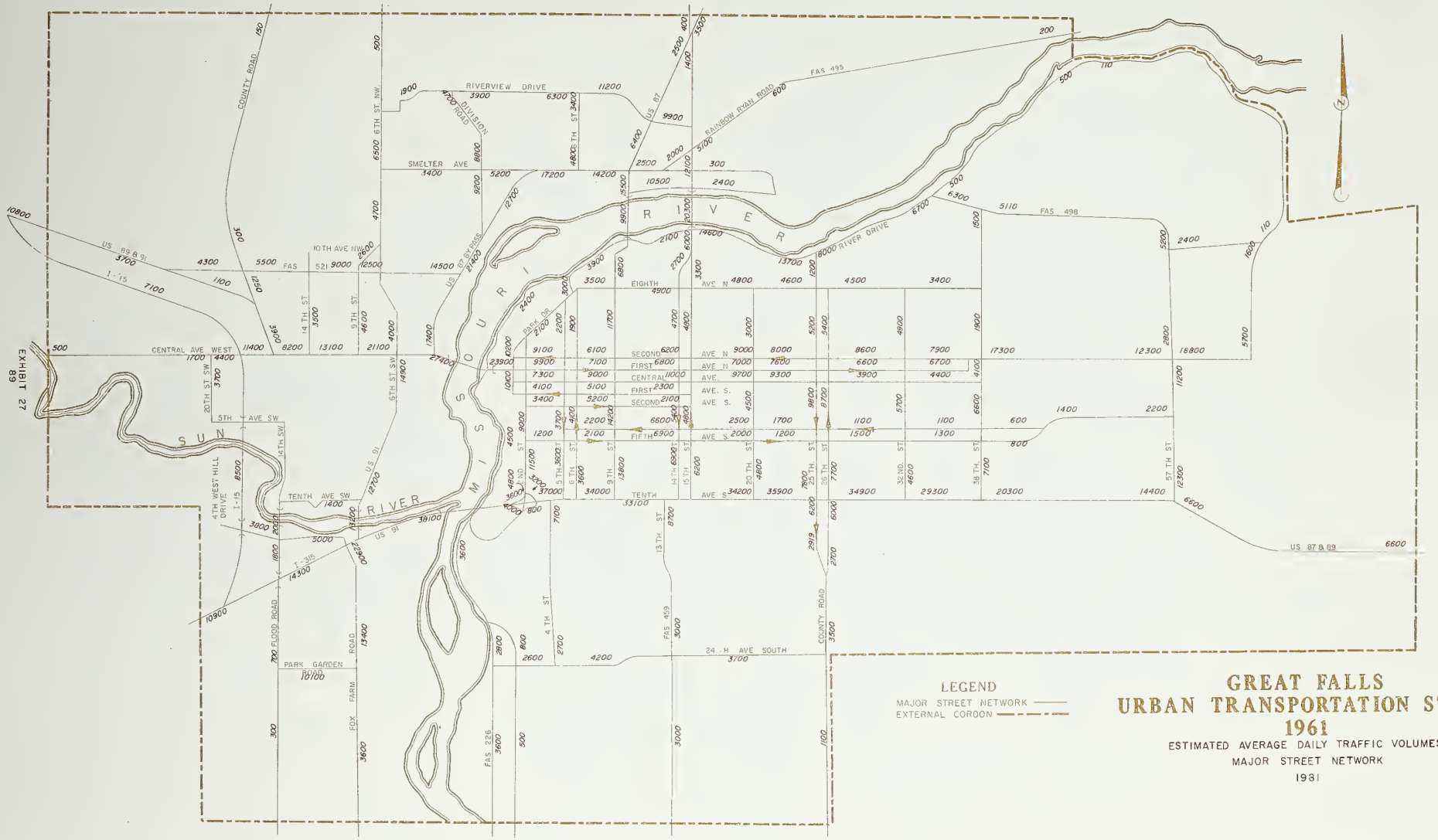


EXHIBIT 27
89

LEGEND
MAJOR STREET NETWORK
EXTERNAL CORDON

GREAT FALLS URBAN TRANSPORTATION STUDY 1961

ESTIMATED AVERAGE DAILY TRAFFIC VOLUMES
MAJOR STREET NETWORK
1981

Recommendations

RECOMMENDATIONS

GENERAL

Traffic capacity analyses, of 1981 traffic volume assignments to the committed major street system, indicated the locations of necessary street improvements. The recommended major street system includes these improvements and should provide direct, fast and safe routes of travel for motorists in the foreseeable future. In order for the present street system to handle traffic volumes estimated at about 90 percent greater than present volumes, it will be necessary to provide certain street extensions, widen existing streets, signalize and channelize intersections, construct additional bridges and create additional one-way couplets. All of these methods have been utilized to arrive at the most economical major street system that will adequately handle the anticipated 1981 traffic volumes in the Great Falls Study Area.

THE RECOMMENDED MAJOR STREET SYSTEM

Exhibit 28 on page 94 illustrates the recommended major street system for 1981. The locations of future freeways, arterials and collector streets are shown in this exhibit. Exhibit 29 on the opposite page illustrates all streets in the study area that are expected to be in use by 1981.

A comparison of the 1961 and the recommended 1981 major street network mileage is summarized in the following tabulation:

COMPARISON OF THE 1961 AND THE 1981 MAJOR STREET NETWORK MILEAGE

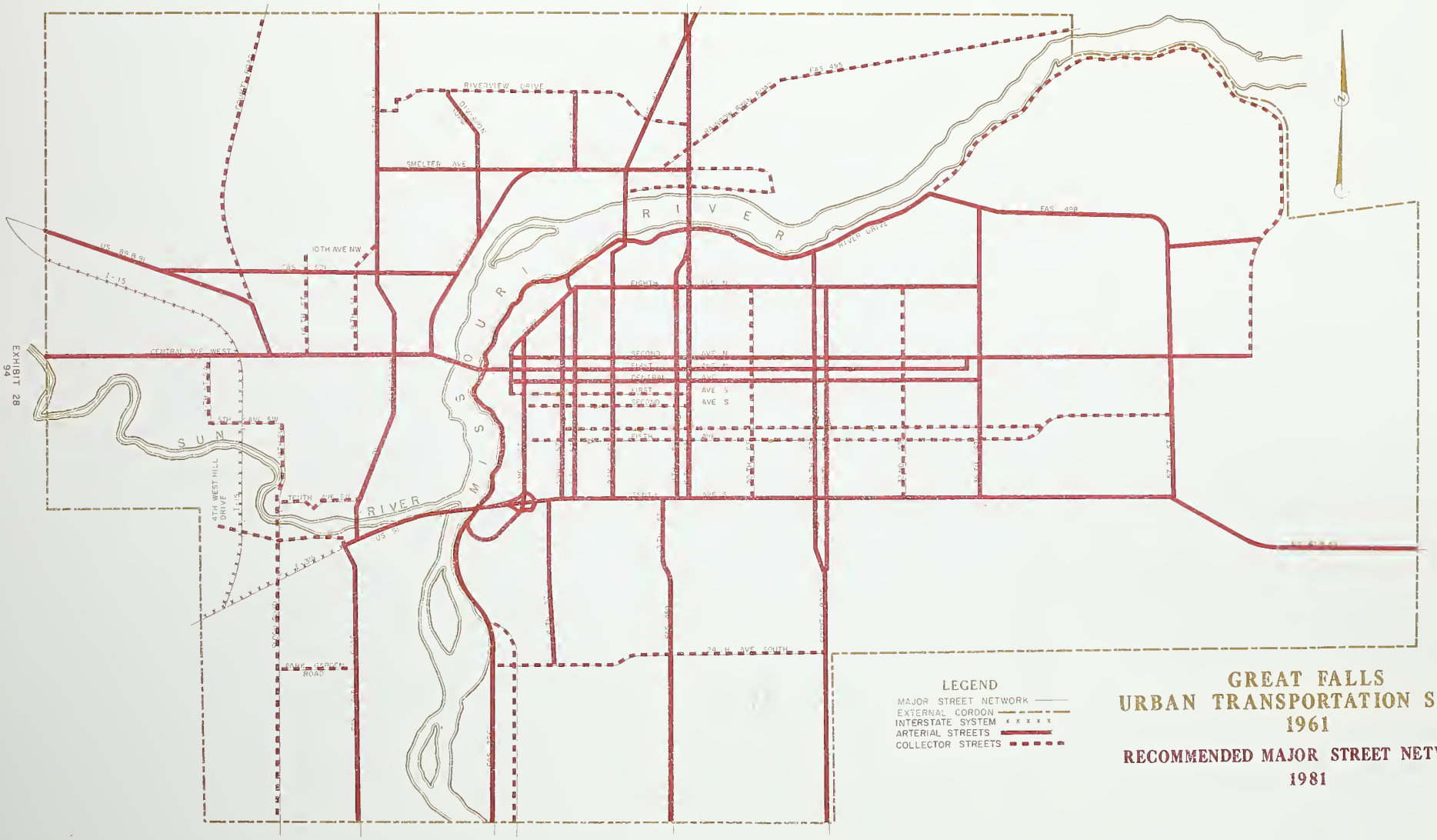
Street Classification	Network Mileage		Percent of Network Mileage		Percent of Total Street Mileage	
	1961	1981	1961	1981	1961	1981
Urban Interstate	0.0	4.1	0.0	3.7	0.0	1.2
Arterial Streets	54.3	71.2	68.8	64.1	23.0	22.5
Collector Streets	22.7	35.8	31.2	32.2	9.6	11.3
TOTALS	77.0	111.1	100.0	100.0	32.6	35.0

ARTERIAL AND COLLECTOR ROUTE STANDARDS

While not incorporating the higher design features of expressways and freeways, major arterial and collector routes should be designed to achieve maximum traffic capacity.

The geometrics of major streets in an urban area will vary greatly but the following features of design standards recommended by the National Committee on Urban Transportation are considered desirable.

Design Elements (All widths in feet)	Arterial Streets	Collector Streets	
		Single Family Residential	Other
Number of Traffic Lanes	2 - 6	2	4
Width of Traffic Lanes	11 - 12	10	11
Width of Curb Parking Lane or Shoulder	8 - 10	10	10
Width of Border Area	8 - 12	10	8
Median Width	4 - 16	-	-
Right-of-Way Width	80 - 120	60	80
Design Speed	40	30	30
Stopping Sight Distance	275	200	200
Superelevation	.06	.06	.06
Degree of Curve	11	21	21
Grade	4	8	8



GREAT FALLS URBAN TRANSPORTATION STUDY 1961

RECOMMENDED MAJOR STREET NETWORK 1981

EXHIBIT 28
94

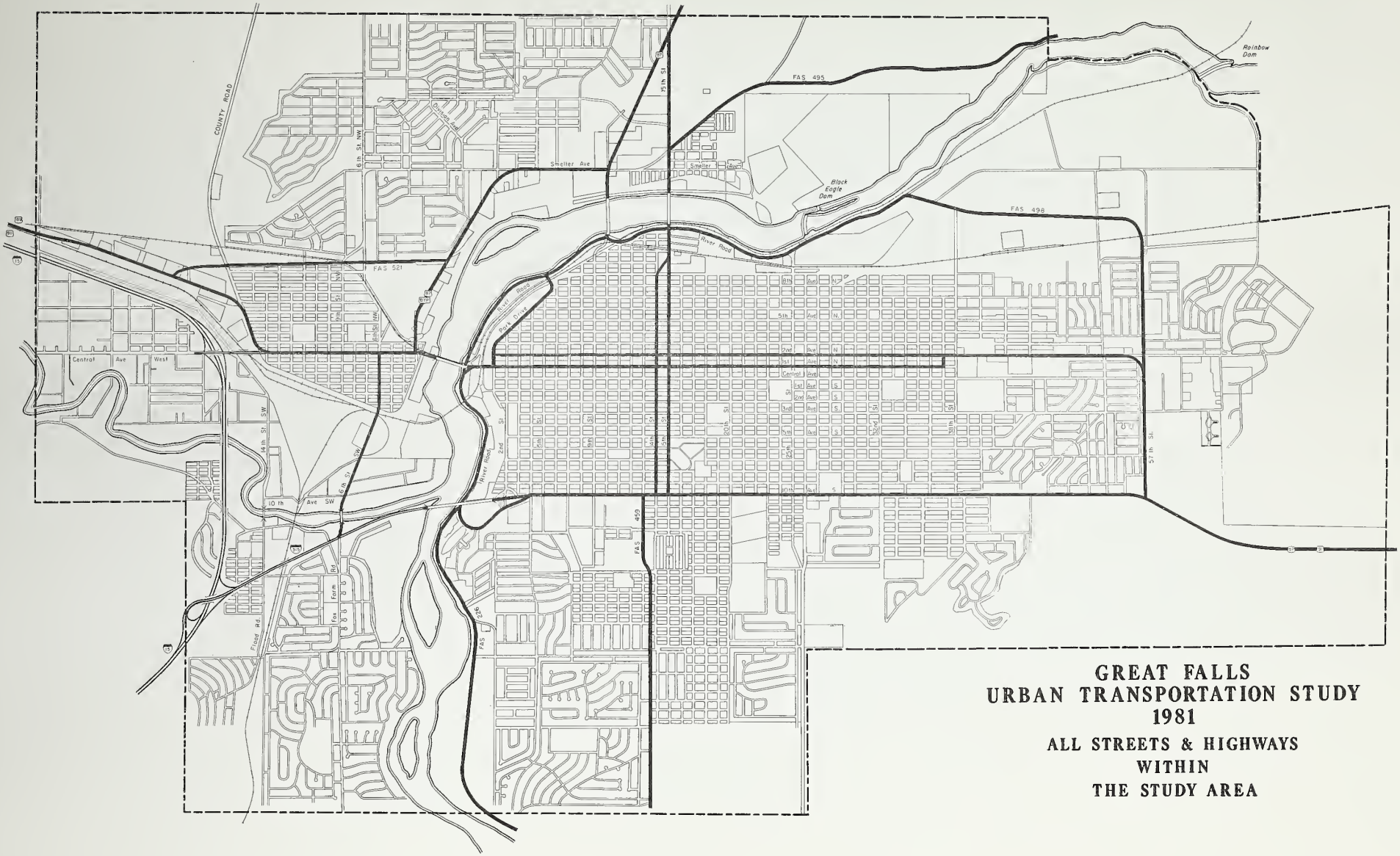


EXHIBIT 29
95

GREAT FALLS URBAN TRANSPORTATION STUDY 1981

ALL STREETS & HIGHWAYS WITHIN THE STUDY AREA

The predominant right-of-way width of streets within the original townsite of Great Falls is 80 feet, with a curb-to-curb width of 51 feet in the downtown area, and 35 feet in residential areas. Due to the narrow pavement widths through the residential areas, it has been necessary to recommend widening or converting to one-way operation, in order to gain the necessary traffic capacity on the major street system.

Right-of-way widths of major streets in the newer additions to the original townsite have been generally 70-80 feet with a maximum pavement width of 36 feet. It is recommended that the minimum pavement width of major streets be increased to 44 feet, in future subdivisions. This will allow ample width for four 11 foot lanes for moving traffic, by removing parking, if future traffic volumes warrant such operation. The typical cross sections shown in Exhibit 30 on page 97 illustrate how 60, 70 and 80 foot right-of-way widths may be utilized under various conditions.

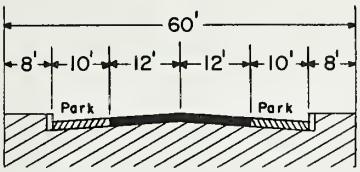
The various proposed improvements on the recommended system are discussed individually in the following section. Estimated costs of these improvements were obtained from the State Highway Department and the Great Falls City Engineer's Office. They reflect current bid prices for similar construction.

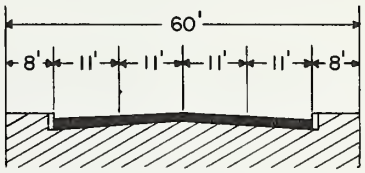
RECOMMENDED IMPROVEMENTS TO COMMITTED SYSTEM

Warden Bridge - 10th Avenue South

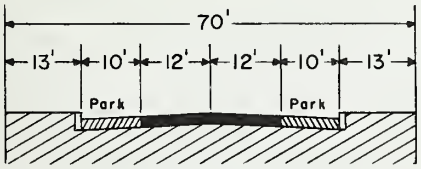
The present two-lane structure, over the Missouri River, was operating at about it's practical traffic capacity of 12,000 vehicles per day in 1961. The assignment of future traffic indicates about 38,000 vehicles per day will be using this bridge by 1981. This volume will definitely require

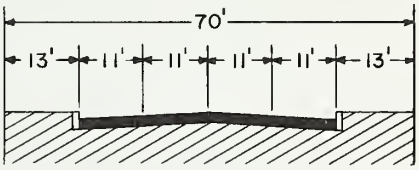
TYPICAL CROSS SECTIONS



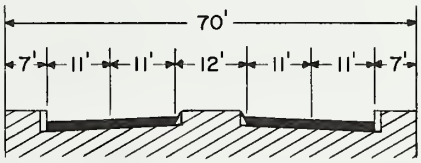


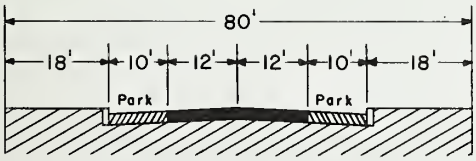
60 FOOT
MINIMUM

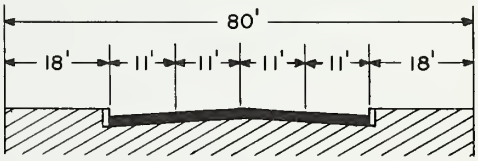




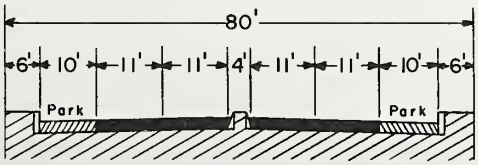
70 FOOT
MINIMUM

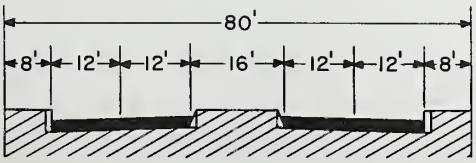






80 FOOT
MINIMUM





GREAT FALLS
URBAN
TRANSPORTATION
STUDY

EXHIBIT 30

four lanes. It is recommended that an additional two-lane structure be built adjacent to the present bridge within the first five-year priority period of 1965-1970. This improvement is estimated to cost about $1,500,000.

Sun River Bridge - Sixth Street Southwest

This bridge, spanning the Sun River, was built in 1928. The through steel truss span has a 19 foot roadway and a 11'-9" vertical clearance. It was approaching practical traffic capacity in 1961 and it is estimated that about 13,500 vehicles per day will be using a bridge in this location by 1981. It is recommended that the present bridge be replaced by a four-lane structure. This improvement is scheduled for construction in the first priority period of 1965-1970 at an estimated cost of $775,000.

Sun River Bridge - Fourteenth Street Southwest

This bridge, over the Sun River, was constructed by Cascade County during the horse and buggy era. It has only 16 feet of horizontal clearance and is now posted for a four ton load limit. It is, therefore, obsolete even for the small volume of traffic presently using the structure. By 1981 it is estimated that about 2,000 vehicles per day will be using a bridge in this location.

It is, therefore, recommended that this bridge be replaced with a modern two-lane structure during the first priority period of 1965-1970. The estimated cost of replacing this structure is about $350,000.

Sixth Street Southwest

This arterial, from the Sun River Bridge to Central Avenue West, is scheduled for reconstruction to a four-lane standard by 1970. The proposed improvement also includes the widening of the two-lane underpass of the Great Northern Railway. Estimated 1981 traffic volumes on

this facility will range from 13,500 to 15,000 vehicles per day. The estimated cost of this improvement is $450,000.

US 87 Bypass - Third Street Northwest

This important bypass extends from Central Avenue West to 10th Street. It is scheduled for reconstruction to a four-lane standard in the first five-year construction period from 1965-1970. Estimated 1981 traffic volumes will range from 12,500 vehicles on the north to 21,500 vehicles near the intersection of the Northwest Bypass. Special intersection treatment and signalization should be provided at Central Avenue West, the Northwest Bypass, Division Road Extension, Smelter Avenue, and 10th Street. Total cost of reconstruction and signalization is estimated at $300,000.

Northwest Bypass - FAS 521

This proposed east-west arterial connects old US 91 on the west with US 87 Bypass (3rd Street) on the east. It will relieve Central Avenue West of a large part of the expected traffic load, after the completion of Interstate 15. It is scheduled to go to contract as a four-lane facility in 1965. Signalization will be provided at the intersections of 6th and 9th Streets. Conduit will also be installed at 14th Street, to provide for a future signal at this intersection if traffic volumes justify the installation. Traffic volumes on this arterial will range from 4,200 to 14,500 vehicles per day by 1981. The cost of this project is estimated at $545,000.

Central Avenue West

This important east-west arterial, located on the west side of the Missouri River, will be carrying traffic volumes of from 8,200 to 21,000

by 1981. The section from 9th Street to 14th Street is now operating as a two-lane facility and can be expected to carry about 11,000 vehicles per day in the future.

In order to facilitate the movement of these expected traffic volumes, between the interchange with I 15 on the west and the central business district, it is recommended that the section of Central Avenue West between 9th and 14th Streets be reconstructed to a four-lane standard. The reconstruction of this section will complete a continuous four-lane facility from the Central Avenue West Interchange with I 15 to Park Drive.

The estimated cost of this improvement is about $143,000. Construction should be programed for the first priority period of 1965-1970.

River View Drive

The fastest growing residential area in Great Falls at the present time is the River View area, situated north of Smelter Avenue and west of US 87. This area extends about one mile north and south and two miles east and west. At present there is only one arterial (Smelter Avenue) serving the entire east-west movement of traffic and this avenue is located on the extreme southern edge of the area.

In order to facilitate the east-west movement of traffic from this area, and to provide relief for the congestion on Smelter Avenue, it is recommended that River View Drive be extended easterly from 8th Street Northeast to the 15th Street extension, a distance of about 0.6 mile. This extension will also have the further advantage of diverting traffic from the two-lane 10th Street Bridge to the new four-lane 15th Street Bridge.

Traffic volumes on this extension should approximate 10,000 vehicles

per day by 1981. This volume will warrant four-lane construction on the proposed extension and the prohibition of curb parking on the existing section from 6th to 8th Streets Northeast.

Due to some heavy construction on the section just west of old US 87, the estimated cost of this improvement will be about $150,000. Construction should be programed in the first priority period of 1965-1970.

Division Road

Division Road, serves as an important north-south arterial, which connects River View Drive on the north with Smelter Avenue on the South. This arterial's importance will increase with the expected further development of the River View residential area to the north of River View Drive.

It is recommended that this arterial be extended southerly from Smelter Avenue to 3rd Street Bypass, a distance of about 0.4 mile. This extension will provide a more direct route from the River View addition to the central business district and will relieve the intersection of Smelter Avenue and 3rd Street Bypass of a substantial traffic load.

The assigned 1981 traffic volumes of about 9,200 vehicles per day on this extension will require four lanes. Signals should also be provided at the intersections of Smelter Avenue and 3rd Street Bypass. Parking at the curb should be prohibited on the existing section between River View East and Smelter Avenue.

Construction of this extension should be scheduled in the first priority period of 1965-1970. Total cost including right-of-way, construction and signalization is estimated at about $60,000.

Sixth Street Northwest

It is recommended that 6th Street Northwest, from Central Avenue West on the south to the urban limits on the north, be developed to major arterial standards in the second construction priority period of 1971-1975. This street provides a direct route from the large residential area north of Smelter Avenue to the Northwest Bypass and Central Avenue West. It is estimated that 1981 traffic volumes will range from 2,600 to 6,500 vehicles per day with the heaviest volumes occurring between River View Drive and the Northwest Bypass. A four-lane standard facility is recommended for about 1.0 mile between River View Drive and the Northwest Bypass. Two lanes are considered adequate for the remainder of the route. Signals are contemplated at the intersection of the Northwest Bypass and are now in place at the intersection of Central Avenue West. Present right-of-way is 80 feet on the recommended four-lane section and from 60 to 80 feet on the remainder of the route. Total cost of this improvement is estimated at $120,000.

Fourteenth Street Northwest

It is recommended that this street be improved to a two-lane arterial standard from Central Avenue West to 10th Avenue Northwest in the Valley View Homes Addition, by providing a minimum of 44 feet between curbs within the 80 foot right-of-way. This improvement will provide a reasonably direct route from the residential areas in the northwest portion of the city to Interstate 15. It will also provide a badly needed north-south access route into the Valley View Homes Addition. The intersections of this route, with the Northwest Bypass (FAS 521) and Central Avenue West, will probably require signalization, and a grade crossing of the C.M.St.P.&P.

railroad branch line will also be required just south of 10th Avenue Northwest.

Traffic volumes on this route are expected to range from 3,300 to 3,500 vehicles per day. The estimated cost of this improvement is about $90,000. Construction should be scheduled in the period of 1971-1975.

Lower Sun River Road between Fourth West Hill Drive and Sixth Street SW

This road will become increasingly important after the construction of Interstate 15 to the west and the Interstate Spur 315 on the south. It will then become the principal east-west access route for the triangular area between the two Interstate routes and Sun River, as well as, the only access route for the West Hill residential addition located west of Interstate 15. Traffic volumes on this facility are expected to range from 3,500 to 5,000 vehicles per day by 1981.

In order to accommodate these volumes, it is recommended that this facility be improved to a two-lane arterial standard from 4th West Hill Drive to 6th Street Southwest, a distance of about 0.9 mile. The underpass of the Great Northern Railroad should also be improved, to provide adequate vertical clearance. The intersection with 10th Avenue South is now being changed from 6th Street Southwest just south of the Sun River Bridge westerly to a point common with the intersection of US 91 and the Fox Farm road as shown in Exhibit 33 on page 123. This change should eliminate part of the traffic conflicts that existed at the old intersection location.

The estimated cost of this improvement is about $100,000. The improvement of this route, and particularly reconstruction of the underpass to an adequate vertical clearance, should be undertaken during the first priority period of 1965-1970.

Fifth Avenue Southwest and 20th Street Southwest

The construction of the Central Avenue West interchange on Interstate 15 will necessarily prohibit the access between Galt Avenue and Central Avenue West, just east of the interchange. The proposed improvement of 5th Avenue Southwest and 20th Street Southwest from 14th Street Southwest to Central Avenue West will restore the continuity to the street system in this area and provide access to Central Avenue West for the north-south traffic. A separation at 5th Avenue Southwest is being provided in the Interstate construction.

Traffic on this proposed improvement will average about 2,700 vehicles per day in 1981. It is now scheduled for construction in 1966 at a total cost of $147,000.

Fox Farm Road

After the construction of Interstate Spur 315, Fox Farm Road will become the only direct access route to the large residential area south of Interstate 315 and west of the Country Club. Practically all traffic to and from this entire area will necessarily be forced to use portions of this arterial due to the lack of other access to Interstate 315 and US 91.

Traffic volumes on this street are expected to range from 3,500 on the extreme south to 22,900 just south of the intersection with US 91. It will be necessary to provide four lanes for this volume of traffic, from the intersection of US 91 south to Park Garden Road, a distance of about 0.7 mile. The present 70 foot right-of-way should be ample to accommodate a four-lane arterial,without parking in this location. Traffic volumes at the intersection of US 91 warrant an interchange. It is, therefore, recommended that the feasibility of a future interchange at this location be given further study. If an interchange

is feasible, the location of the Sun River Bridge on 6th Street Southwest should be adjusted to coincide with the future interchange location.

The estimated cost of this improvement is about $107,000 without interchange. Construction should be scheduled in the third priority period of 1975-1981.

North River Road

This section of street has become an important connecting link between 10th and 15th Streets, since the construction of a grade separation structure prohibited the direct access between Smelter Avenue and 15th Street. Traffic enroute from the residential areas adjacent to Smelter Avenue to locations south of the Missouri River and east of 15th Street find this connection advantageous. Traffic on this street is expected to approximate 10,000 vehicles per day by 1981. This volume will require four lanes and signalization at the intersection of 10th Street.

Total cost of 0.4 mile of reconstruction and one signal installation is estimated at about $55,000. Construction should be programed for the period of 1976-1981.

River Drive - 10th Street to Giant Springs Road

Assigned 1981 traffic volumes on River Drive indicate that it will be necessary to widen this facility to four lanes from 10th Street easterly to the junction with Giant Springs Road, a distance of about 2.1 miles. This important arterial will act as a belt route around the northern edge of the city and will provide a fairly fast route between Malmstrom Airbase and the residential areas to the northwest. Traffic volumes on this proposed improvement are expected to range from 6,500 to 14,600 vehicles by 1981. The estimated cost for right-of-way and

construction is $350,000. Construction should be programed for the third priority period of 1975-1981.

River Drive - 10th Street to 10th Avenue South

This route parallels the Missouri River on the north and west and is a vital part of a belt route around the city. It is also a part of Federal Aid Primary Route 41. At present there are four underpasses on this section of River Road. Two of these structures, under the First Avenue North Bridge and the adjacent Milwaukee Railroad Bridge, have only 10 feet and 11 feet respectively of vertical clearance.

These structures effectively limit the traffic on this route to passenger cars and light trucks. In spite of this limitation, the present traffic volumes average about 2,000 vehicles per day and they are expected to increase to about 3,500 by 1981.

It is recommended that this route be developed into a belt route around the city for both passenger cars and trucks, by reconstructing the underpasses under the two bridges at First Avenue North to provide adequate vertical clearances. This will undoubtedly require a pumping system during high water on the Missouri River. About two miles of roadway, built in 1934, should also be reconstructed to a two-lane standard from 10th Avenue South to 10th Street Bridge. The right-of-way dispute now pending in the Gibson Park area should be resolved at once, to insure the continuity of this route.

Total cost of reconstruction of roadway and structures is estimated at $400,000. Reconstruction should be programed for the third priority period of 1976-1981.

First and Second Avenues North

These avenues have been operating successfully as a one-way couplet between Park Drive and 37th Street for several years. They provide the main artery of travel between the central business district and Malmstrom Airbase and serve the intervening residential areas as a major arterial route. Traffic on this couplet was approaching practical capacity in 1961, due primarily to the narrow 35 foot curb-to-curb widths on First Avenue North between 10th and 37th Streets and on Second Avenue North between Park Drive and 37th Street. Parking is now being permitted on both sides of each avenue, which allows a maximum of 19 feet for two lanes of moving traffic. The 1981 traffic assignment to the couplet indicates a range of from 6,400 to 10,000 vehicles per day in each direction. The east-west corridor assignment of 1981 traffic to First and Second Avenues North, and Central Avenue indicates a total traffic volume of from 19,500 to 28,100 on the three arterials located one block apart in the corridor. In order to handle the estimated 1981 traffic volumes in an acceptable manner, it is recommended that eight feet of the outside boulevard be removed on both sides of each arterial between 10th and 37th Streets on First Avenue North and between Park Drive and 37th Street on Second Avenue North. This improvement will provide a 51 foot curb-to-curb width throughout the entire length of both one-way streets. The 51 foot curb-to-curb width can be used for a nine foot parking lane on each side and three 11 foot lanes for moving traffic. As an alternate to removing the outside boulevards, it will be necessary to prohibit parking on both sides of each avenue on the sections that are now less than 51 feet in curb-to-curb width. The removal of the

outside boulevards and paving of the additional width is estimated to cost $650,000. The cost of additional signing required to prohibit parking on the narrow sections of both avenues is estimated at about $7,000. Parking should be removed immediately and street widening programed for the period of 1971-1975.

Fourth and Fifth Avenues South

In order to relieve part of the traffic load that is expected on 10th Avenue South, it is recommended that Fourth and Fifth Avenues South be converted to an east-west one-way couplet between 5th Street and 43rd Street. Priority should be given to the east-west traffic movement on this couplet at the intersections of 20th, 32nd and 38th Streets.

It is estimated that this couplet will relieve 10th Avenue South of traffic volumes ranging from 1,500 to 10,000 vehicles per day by 1981. This relief will enable 10th Avenue South to handle the assigned volumes in the foreseeable future.

The estimated cost of converting these two avenues to one-way operation is $11,000. This improvement should be made in the second priority period of 1971-1975.

Tenth Avenue South

Tenth Avenue South from 6th Street Southwest to 57th Street was originally constructed as a "south side bypass". It was opened to through traffic in 1952, after the completion of the Warden Bridge over the Missouri River. Due to the fact that this facility was constructed to a fairly high four-lane standard, with no control of access, local business immediately found it attractive and proceeded to locate along its length. By 1961 local businesses and several large shopping centers

had formed an almost continuous string of commercial development from 2nd to 38th Streets and traffic volumes ranged from 6,500 to 21,000 vehicles per day. It is expected that commercial development will continue along this avenue and by 1981 the traffic volumes are expected to range from 14,000 to 38,000 vehicles per day. In order to accommodate these volumes, it will be necessary to operate this arterial as a six-lane facility by prohibiting parking on both sides from 3rd to 38th Streets. The present curb-to-curb width of 80 feet with a 16 foot median can be utilized for six lanes of moving traffic as shown in Exhibit 38 on page 130.

Total cost of signing and striping is estimated at $7,200.

Twenty-Fourth Avenue South

It is expected that this avenue will become quite an important east-west arterial in the movement of vehicles between River Road (FAS 226) on the west and the 26th Street Extension on the east. It will also serve the intervening residential areas that are expected to develop by 1981.

Traffic volumes assigned to this arterial will range from 2,600 to 4,200 vehicles by 1981. If 24th Avenue South is not extended and reconstructed, these traffic volumes will naturally move northward to 10th Avenue South where they will intensify the existing congestion.

The entire recommended improvement of 24th Avenue South, to a two-lane arterial standard, will require one mile of reconstruction of existing gravel street between FAS 459 and 26th Street Extension and about 1.1 miles of new construction between FAS 226 and FAS 459. The entire cost of construction and right-of-way is estimated at $235,000. This

improvement should be made in the third priority period of 1976-1981.

Second Street Extension

The intersection of 2nd Street with 10th Avenue South is now made by two ramps to the east and west. The west ramp is one-way for westbound traffic and intersects near the east end of the present Warden Bridge. The east ramp is two-way and is now the principal access point for traffic enroute to the central business district from the Prospect Heights addition to the south. Congestion has been building up at this intersection the past few years and is expected to become substantial when Prospect Heights is fully developed. In order to relieve this congestion, it is recommended that the present at-grade intersection be separated by extending 2nd Street directly south under 10th Avenue South to an intersection with the loop of Federal Aid Route 41 as shown in Exhibit 37 on page 129. Tenth Avenue South is on a fill section at this location which makes the proposed grade separation feasible. It will, however, require two structures on 10th Avenue South and about 700 feet of roadway on 2nd Street.

The assignment of 1981 traffic volumes to this extension indicates about 4,900 vehicles per day would use it. Total cost including structures is estimated at $125,000. This improvement should be programed to coincide with the construction of the bridge over the Missouri River on 10th Avenue South during the period of 1965-1970.

Fourth Street

The continued orderly development of the residential area south of 10th Avenue South and west of 13th Street will require an additional north-south arterial in the vicinity of 4th Street. Fourth Street is now in use from 10th Avenue South to the Grandview Tracts, a distance of about 0.7 mile.

It is recommended that this street be extended southerly to 24th Avenue South, a distance of about 0.3 mile. Traffic volumes on this arterial are expected to range from 2,500 to 7,000 vehicles per day by 1981. An adequate two-lane facility should accommodate these volumes in the foreseeable future.

The total cost of reconstructing the existing street to an oiled arterial standard and extending it about 0.3 mile south will be about $60,000. Construction should be programed for the third construction period of 1975-1981.

Fifth and Sixth Streets

These two streets have been previously approved as a one-way couplet from Park Drive to 10th Avenue South. They are now operating as a one-way couplet from Central Avenue to 10th Avenue South. To improve this operation and gain added traffic capacity, it is recommended that the outside boulevards be removed on both streets from 6th to 10th Avenues South. This will provide a 51 foot curb-to-curb width from Central Avenue to 10th Avenue South. This width will be ample for three moving lanes of traffic and two parking lanes.

Traffic is estimated in the range of from 5,500 to 10,000 vehicles per day by 1981. Total cost of this improvement will be about $117,000

for widening and $3,000 for signing as a one-way couplet. Signing should be done immediately with widening programed for the period of 1971-1975.

Twenty-Fifth and Twenty-Sixth Streets

Twenty-fifth Street between 10th Avenue South and River Drive has been operating as an arterial for some time. It has an 80 foot right-of-way but only a 35 foot curb-to-curb width due to eight feet of outside boulevards on each side. The estimated 1981 traffic volumes on this arterial will range from 12,000 to 15,000 vehicles per day which will seriously overload it for two-way operation. To provide adequate capacity for these future traffic volumes, it is recommended that 25th and 26th Streets be operated as a one-way couplet from 16th Avenue South to 8th Avenue North. This will require new construction on 25th Street from 13th Avenue South to 16th Avenue South. Additional traffic signals should be provided on 25th Street at the intersections of 8th Avenue North and River Drive. They should also be provided on 26th Street at the intersections of 10th Avenue South, Central Avenue, First Avenue North, 2nd Avenue North, and 8th Avenue North. Total cost of new construction, signs, and signalization on this proposed one-way couplet is estimated at $98,000. Conversion to a one-way couplet should be made in the first priority period of 1965-1970. New construction on the south should be programed for 1971-1975.

Malmstrom Airbase Access Road

Some consideration has been given to constructing a second access road to Malmstrom Airbase to connect the north gate to FAS 498 at a point just south of the C.M.St.P.&P. Railroad. .This road has been included in the 1981 traffic assignment to determine future traffic volumes.

It is estimated that an access road in this location will carry about 2,400 vehicles per day, which will require a two-lane facility. Estimated cost of about 0.75 mile of construction in this location is $85,000.

Intersection Treatment of Park Drive and First Avenue North

This intersection was operating at about practical traffic capacity in 1961, due primarily to the heavy left-turn movement from south to west. To expedite the heavy turning movement and thus relieve the intersection of a large part of the present congestion, it is recommended that the south leg of the intersection be widened to provide room for two left-turn lanes as shown in Exhibit 35 on page 127. A third phase for the left-turn movement should also be added to the existing signal as shown in this exhibit.

The additional widening and channelization can be done within the existing right-of-way at total cost of about $14,000. This improvement should be scheduled in the first priority construction period of 1965-1970.

Ninth Street

Ninth Street is one of the most important north-south arterials in the City. It is located on the east edge of the central business district and provides a connection between the residential areas to the northwest and 10th Avenue South. It also is signed as US 87 Alternate to the business district.

Traffic volumes on this route are expected to range from 6,700 to 18,000 vehicles per day by 1981 with the heaviest volumes occurring south of Central Avenue. These volumes will seriously overload the present two-lane facility and will warrant four-lanes to provide adequate capacity.

It is, therefore, recommended that parking be prohibited on both sides of 9th Street from 8th Avenue North to 10th Avenue South. The present 45 foot curb-to-curb width can then be utilized for four 11 foot traffic lanes, with a standard double barrier stripe on centerline.

This relatively inexpensive improvement should be made as quickly as possible. The estimated cost of signing and striping is $2,300.

Intersection Treatment of 15th Street and Rainbow-Ryan Road

This intersection, located north of the 15th Street Bridge in the Black Eagle area, has proven to be potentially dangerous due to limited sight distances. The frontage road serving some businesses in Black Eagle creates additional traffic conflicts by adding an extra leg to an already complicated intersection.

Exhibit 36 on page 128 illustrates how this intersection can be improved by reconstructing about 1,000 feet of the Rainbow Ryan road (FAS 495) and moving the frontage road intersection about 100 feet east on Montana Avenue. This treatment will substantially reduce the present traffic conflicts and will provide adequate sight distances on all legs of both intersections.

This improvement can be made for an estimated cost of about $16,500. It should be made in the first priority period of 1965-1970.

Thirty-Eighth Street

This north-south arterial now extends from 10th Avenue South northerly to 8th Avenue North. Its importance as a major arterial in this area is expected to increase as the urban area develops to the east.

Some years ago, the City of Great Falls formally vacated two blocks

of right-of-way on this street between Central Avenue and 1st Avenue North, to the State School for the Deaf and Blind. The street was never closed to traffic however, and in 1961 this section was carrying about 2,900 vehicles per day. This same two block section is expected to carry about 4,100 vehicles per day by 1981.

In order to prevent the closing of this section of street to traffic, at some future date, it is recommended that right-of-way be acquired as quickly as possible on 38th Street between Central Avenue and First Avenue North. This can possibly be done through a trade of other parcels of land now held by the City of Great Falls and the State of Montana.

To provide continuity in the major street system and aid in the orderly development of the area between 8th Avenue North and River Drive, it is further recommended that 38th Street be extended northerly from 8th Avenue North to FAS 498, a distance of about 0.5 mile. This extension should carry about 1,500 vehicles per day by 1981. It should be constructed to a two-lane arterial standard with a 44 foot pavement width. Total cost of construction and right-of-way is estimated at $80,000.

Construction should be programed for the second priority period of 1966-1970.

Twentieth and Thirty-Second Streets

These two north-south streets have been operating as collectors for sometime and it is not anticipated that their status will be changed in the foreseeable future. The flow of north-south traffic on these streets should,however, be protected by the installation of "yield" signs on the minor intersecting avenues. The approximate cost of this signing is estimated at $3,000.

COST SUMMARY

The cost of the proposed improvements to the major street network in Great Falls amounts to about $7,245,000 exclusive of scheduled improvements on the Interstate system. Proposed improvements and cost estimates are summarized in the tabulation on page 118.

Due to the fact that a substantial portion of the recommended improvements are located on Federal Aid Systems, the total cost will be distributed approximately as follows:

State and Federal	$4,412,500
City or County	2,832,500
TOTAL	$7,245,000

The above distribution of costs between state and federal and local governments, is based upon State Highway Commission policy to assess any city 25 percent of the total cost of improvements on the Federal Aid System within its corporate limits.

A community's ability to pay for future street improvements may be evaluated, to some extent, by the amount of money that has been expended for street and highway improvements during past years. During the 10 year period from January 1, 1955 to December 31, 1964, there has been about $6,750,000 expended in improvements on the major street system in the Great Falls study area, exclusive of Interstate construction. Of this amount about $815,000 came from city and county sources, and $5,945,000 was expended from state and federal funds. The cost of street and highway improvements, that have been completed in the past ten years ($6,750,000), therefore, almost equals the estimated cost of all proposed improvements recommended for construction during the next 15 years ($7,245,000). This comparison indicates

that financing of the proposed 15-year improvement program is feasible, if the local governments share of the costs can be increased to approximately $189,000 per year from the past 10-year rate of about $81,500 per year.

Construction priorities have been assigned to three 5-year periods from 1965-1981 according to need, rather than when financing will become available through normal sources. These tentative priorities should be reviewed in detail at frequent intervals to assure that the improvement program is in harmony with the evolving land use of the study area.

GREAT FALLS URBAN TRANSPORTATION STUDY
RECOMMENDED IMPROVEMENTS - MAJOR STREET SYSTEM
1965 – 1981

DESCRIPTION	FROM — TO	LENGTH	WIDTH PAVED	WIDTH R/W	NO OF LANES	ESTIMATED 1981 A.D.T.	DESCRIPTION OF IMPROVEMENT	NO. OF LANES	WIDTH PAVED	WIDTH R/W	TOTAL COST	STATE AND FEDERA COST	CITY OR COUNTY COST	PRIORITY
Warden Bridge	Missouri River - 10th Avenue South	0.50				38000	Construct Additional 2 Lane Bridge	2	30	100	1,500,000.	1,125,000.	375,000.	1965-1970
6th Street S.W. Bridge	Sun River - 6th Street South West	0.25	19	60	2	13200	Replace Existing Bridge	4	48	80	775,000.	582,000.	193,000.	1965-1970
14th Street S.W. Bridge	Sun River - 14th Street South West	0.25	17	60	2	2000	Replace Existing Bridge	2	24	60	350,000.		350,000.	1965-1970
6th Street S.W.	Sun River to Central Avenue West	0.98	30-34	80	2	13200-14900	Reconstruct to 4 Lanes - Widen Underpass	4	52-68	80-100	450,000.	338,000.	112,000.	1965-1970
3rd Street N.W. - US 87 ByPass	Central Avenue West to 10th Street	2.00	24	80-100	2	12700-21400	Reconstruct to 4 Lanes	4	72	100	400,000.	371,000.	29,000.	1965-1970
N.W. ByPass - FHS 521	Old U.S. 91 to 3rd Street ByPass	1.88				4300-14500	New 4 Lane Construction	4	68	100	545,000.	518,000.	27,000.	1965-1970
Riverview Drive	5th Street N.E. to 15th Street Extension	0.62				11000	New 4 Lane Construction	4	44	80	150,000.		150,000.	1965-1970
Division Road	Smelter Avenue to 3rd Street ByPass	0.45				9200	New 4 Lane Construction	4	44	80	60,000.		60,000.	1965-1970
Lower Sun River Road	4th Street West Hill Drive to US 91	0.90	20	60	2	3500-5000	Reconstruct to 2 Lane	2	24	60	100,000.		100,000.	1965-1970
5th Avenue S.W.-20th StreetS.W.	14th Street S.W. to Central Avenue West	0.90	35	80	2	2700	Reconstruct to 2 Lane	2	24	80	147,000.	110,000.	37,000.	1965-1970
2nd Street Extension	Grade Separation Under 10th Avenue South	0.12		80	2	4900	Separate 10th Avenue South & Extend 2nd St.	2	24	80	125,000.	94,000.	31,000.	1965-1970
Malmstrom Air Base Access Road	North Gate at Malmstrom to FAS 498	0.60				2400	Construct New 2 Lane Access to North Gate	2	24	80	85,000.	85,000.		1965-1970
Park Drive & First Avenue North	Intersection					10000	Widen South Approach For 2 Left Turn Lanes				14,000.		14,000.	1965-1970
9th Street	10th Avenue South - 8th Avenue North	1.40	45	80	2	6700-18000	Signing to Prohibit Parking	4	45	80	2,300.		2,300.	1965-1970
15th Street & Rainbow-Ryan Road	Intersection						Reconstruct Intersection				16,500.	16,500.		1965-1970
Central Avenue West	9th Street - 14th Street	0.48	28	90	2	11400	Reconstruct to 4 Lanes	4	72	90	143,000.	107,000.	36,000.	1965-1970
20th & 32nd Streets	Intersecting Minor Streets						Sign Minor Intersections With Yield Signs				3,000.		3,000.	1965-1970
6th Street Northwest	Central Avenue West to North Urban Limits	2.25	24-35	60-80	2	2600-6500	Reconstruct 1.0 mile to 4 Lane-1.25 mi.-2Lanes	2-4	44-48	60-80	120,000.		120,000.	1971-1975
14th Street Northwest	Central Avenue West to 10th Avenue N.W.	0.65		80	2	3500	Reconstruct to 2 Lane	2	44	80	90,000.		90,000.	1971-1975
1st & 2nd Avenues N. Couplet	Park Drive to 37th Street	5.12	35	80	4	12000-20000	Remove outside Boulevards where required on Couplet	6	51	80	650,000.	488,000.	162,000.	1971-1975
4th & 5th Avenues S. Couplet	5th Street to 43rd Street	6.22	35	80	4	1500-10000	Signing for one way operation	4	35	80	11,000.		11,000.	1971-1975
5th & 6th Streets - Couplet	6th Avenue South to 10th Avenue South	0.60	35	80	4	6200	Remove outside boulevards	6	51	80	117,000.		117,000.	1971-1975
25th & 26th Streets - Couplet	8th Avenue North to 16th Avenue South	3.90	35	80	4	12000-15000	Construct 0.3 miles on 25th Street-Signs and Signals	4	35	80	98,000.	15,000.	83,000.	1971-1975
38th Street	10th Avenue South - FAS Route 498	0.50	35	80	2	1500-4100	Acquire R/W - 2 blocks - Construct 0.5 miles	2	44	80	80,000.		80,000.	1971-1975
Fox Farm Road	Park Garden Road to US 91	0.70	35	70	2	3500-22900	Widen to 4 Lanes	4	44	70	*107,000.		107,000.	1976-1981
North River Road	10th Street to 15th Street	0.40	36	60	2	10000	Widen to 4 Lanes- 1 Signal	4	44	60	55,000.		55,000.	1976-1981
River Drive	10th Street to Big Spring Road	2.10	24	100	2	6500-14600	Widen to 4 Lanes - 1 Signal	4	48	100	350,000.	263,000.	87,000.	1976-1981
10th Avenue South	2nd Street to 38th Street	3.00	80	100	4	14000-38000	Signing and Striping for 6 Lanes	6	80	100	6,200.		6,200.	1976-1981
24th Avenue South	River Drive (FAS 226) to 26th Street	2.10		80	2	2600-4200	Reconstruct 1.0 mile-1.1 miles new Const.	2	44	80	235,000.		235,000.	1976-1981
4th Street	24th Avenue South to 10th Avenue South	1.00		80	2	2500-7000	Reconstruct 0.7 miles-0.3 miles new Const.	2	44	80	60,000.		60,000.	1976-1981
River Drive	10th Avenue South - 10th Street	2.70	24	60	2	2400-4500	Reconstruct to 2 Lanes-Reconstruct Underpasses	2	24	60	400,000.	300,000.	100,000.	1976-1981
										TOTAL	$7,245,000.	4,412,500.	2,832,500.	

* - Does not include cost of Interchange

GREAT FALLS URBAN TRANSPORTATION STUDY
RECOMMENDED IMPROVEMENTS - MAJOR STREET SYSTEM
1965 - 1981

DESCRIPTION	FROM — TO	LENGTH	WIDTH PAVED	WIDTH R/W	NO. OF LANES	ESTIMATED 1981 A.D.T.	DESCRIPTION OF IMPROVEMENT	NO. OF LANES	WIDTH PAVED	WIDTH R/W	TOTAL COST	STATE AND FEDERA COST	CITY OR COUNTY COST	PRIORITY
Warden Bridge	Missouri River - 10th Avenue South	0.50				38000	Construct Additional 2 Lane Bridge	2	30	100	1,500,000.	1,125,000.	375,000.	1965-1970
6th Street S.W. Bridge	Sun River - 6th Street South West	0.25	19	60	2	13200	Replace Existing Bridge	4	48	80	775,000.	582,000.	193,000.	1965-1970
14th Street S.W. Bridge	Sun River - 14th Street South West	0.25	17	60	2	2000	Replace Existing Bridge	2	24	60	350,000.		350,000.	1965-1970
6th Street S.W.	Sun River to Central Avenue West	0.98	30-34	80	2	13200-14900	Reconstruct to 4 Lanes - Widen Underpass	4	52-68	80-100	450,000.	338,000.	112,000.	1965-1970
3rd Street N.W. - US 87 ByPass	Central Avenue West to 10th Street	2.00	24	80-100	2	12700-21400	Reconstruct to 4 Lanes	4	72	100	400,000.	371,000.	29,000.	1965-1970
N.W. ByPass - FHS 521	Old U.S. 91 to 3rd Street ByPass	1.88				4300-14500	New 4 Lane Construction	4	68	100	545,000.	518,000.	27,000.	1965-1970
Riverview Drive	5th Street N.E. to 15th Street Extension	0.62				11000	New 4 Lane Construction	4	44	80	150,000.		150,000.	1965-1970
Division Road	Smelter Avenue to 3rd Street ByPass	0.45				9200	New 4 Lane Construction	4	44	80	60,000.		60,000.	1965-1970
Lower Sun River Road	4th Street West Hill Drive to US 91	0.90	20	60	2	3500-5000	Reconstruct to 2 Lane	2	24	60	100,000.		100,000.	1965-1970
5th Avenue S.W.-20th StreetS.W.	14th Street S.W. to Central Avenue West	0.90	35	80	2	2700	Reconstruct to 2 Lane	2	24	80	147,000.	110,000.	37,000.	1965-1970
2nd Street Extension	Grade Separation Under 10th Avenue South	0.12		80	2	4900	Separate 10th Avenue South & Extend 2nd St.	2	24	80	125,000.	94,000.	31,000.	1965-1970
Malmstrom Air Base Access Road	North Gate at Malmstrom to FAS 498	0.60				2400	Construct New 2 Lane Access to North Gate	2	24	80	85,000.	85,000.		1965-1970
Park Drive & First Avenue North	Intersection					10000	Widen South Approach For 2 Left Turn Lanes				14,000.		14,000.	1965-1970
9th Street	10th Avenue South - 8th Avenue North	1.40	45	80	2	6700-18000	Signing to Prohibit Parking	4	45	80	2,300.		2,300.	1965-1970
15th Street & Rainbow-Ryan Road	Intersection						Reconstruct Intersection				16,500.	16,500.		1965-1970
Central Avenue West	9th Street - 14th Street	0.48	28	90	2	11400	Reconstruct to 4 Lanes	4	72	90	143,000.	107,000.	36,000.	1965-1970
20th & 32nd Streets	Intersecting Minor Streets						Sign Minor Intersections With Yield Signs				3,000.		3,000.	1965-1970
6th Street Northwest	Central Avenue West to North Urban Limits	2.25	24-35	60-80	2	2600-6500	Reconstruct 1.0 mile to 4 Lane-1.25 mi-2Lanes	2-4	44-48	60-80	120,000.		120,000.	1971-1975
14th Street Northwest	Central Avenue West to 10th Avenue N.W.	0.65		80	2	3500	Reconstruct to 2 Lane	2	44	80	90,000.		90,000.	1971-1975
1st & 2nd Avenues N. Couplet	Park Drive to 37th Street	5.12	35	80	4	12000-20000	Remove outside Boulevards where required on Couplet	6	51	80	650,000.	488,000.	162,000.	1971-1975
4th & 5th Avenues S. Couplet	5th Street to 43rd Street	6.22	35	80	4	1500-10000	Signing for one way operation	4	35	80	11,000.		11,000.	1971-1975
5th & 6th Streets - Couplet	6th Avenue South to 10th Avenue South	0.60	35	80	4	6200	Remove outside boulevards	6	51	80	117,000.		117,000.	1971-1975
25th & 26th Streets - Couplet	8th Avenue North to 16th Avenue South	3.90	35	80	4	12000-15000	Construct 0.3 miles on 25th Street-Signs and Signals	4	35	80	98,000.	15,000.	83,000.	1971-1975
38th Street	10th Avenue South - FAS Route 498	0.50	35	80	2	1500-4100	Acquire R/W - 2 blocks - Construct 0.5 miles	2	44	80	80,000.		80,000.	1971-1975
Fox Farm Road	Park Garden Road to US 91	0.70	35	70	2	3500-22900	Widen to 4 Lanes	4	44	70	*107,000.		107,000.	1976-1981
North River Road	10th Street to 15th Street	0.40	36	60	2	10000	Widen to 4 Lanes- 1 Signal	4	44	60	55,000.		55,000.	1976-1981
River Drive	10th Street to Big Spring Road	2.10	24	100	2	6500-14600	Widen to 4 Lanes - 1 Signal	4	48	100	350,000.	263,000.	87,000.	1976-1981
10th Avenue South	2nd Street to 38th Street	3.00	80	100	4	14000-38000	Signing and Striping for 6 Lanes	6	80	100	6,200.		6,200.	1976-1981
24th Avenue South	River Drive (FAS 226) to 26th Street	2.10		80	2	2600-4200	Reconstruct 1.0 mile-1.1 miles new Const.	2	44	80	235,000.		235,000.	1976-1981
4th Street	24th Avenue South to 10th Avenue South	1.00		80	2	2500-7000	Reconstruct 0.7 miles-0.3 miles new Const.	2	44	80	60,000.		60,000.	1976-1981
River Drive	10th Avenue South - 10th Street	2.70	24	60	2	2400-4500	Reconstruct to 2 Lanes-Reconstruct Underpasses	2	24	60	400,000.	300,000.	100,000.	1976-1981
										TOTAL	$7,245,000.	4,412,500.	2,832,500.	

* - Does not include cost of Interchange

GREAT FALLS
URBAN TRANSPORTATION STUDY
RECOMMENDED IMPROVEMENTS
2 (Number of Lanes)
Proposed Street Widening
Proposed Street Extensions
Reconstruct Some Number of Lanes
One Way Streets
0 600' 1200' 2400'
N
River Veiw Drive
Division Road
FAS 521
River Road
FAP 41
Central Ave W.
2nd St
5th St S
6th St S
5th St N
6th St N
2nd Ave N
1st Ave N
Central Ave

EXHIBIT 31

GREAT FALLS
URBAN TRANSPORTATION STUDY
RECOMMENDED IMPROVEMENTS
Proposed Street Widening
Proposed Street Extensions
Reconstruct Some Number of Lanes
One Way Streets
2 (Number of Lanes)
0 600' 1200' 2400'
N
FAS 495
River Drive
14th St N
15th St N
25th St N
26th St N
38th St N
2nd Ave N
1st Ave N
25th St S
26th St S
(Additional Right-of-Way Required)

EXHIBIT 32

I-15
I-315
I-15
FAP 41
2nd St S
4th Ave S.
5th Ave S.
5th St S.
6th St S.
4th St S.
24th Ave S.
Proposed Street Widening
Proposed Street Extensions
Reconstruct Same Number of Lanes
One Way Streets
2 (Number of Lanes)
0 600' 1200' 2400'
N
GREAT FALLS
URBAN TRANSPORTATION STUDY
RECOMMENDED IMPROVEMENTS

EXHIBIT 33

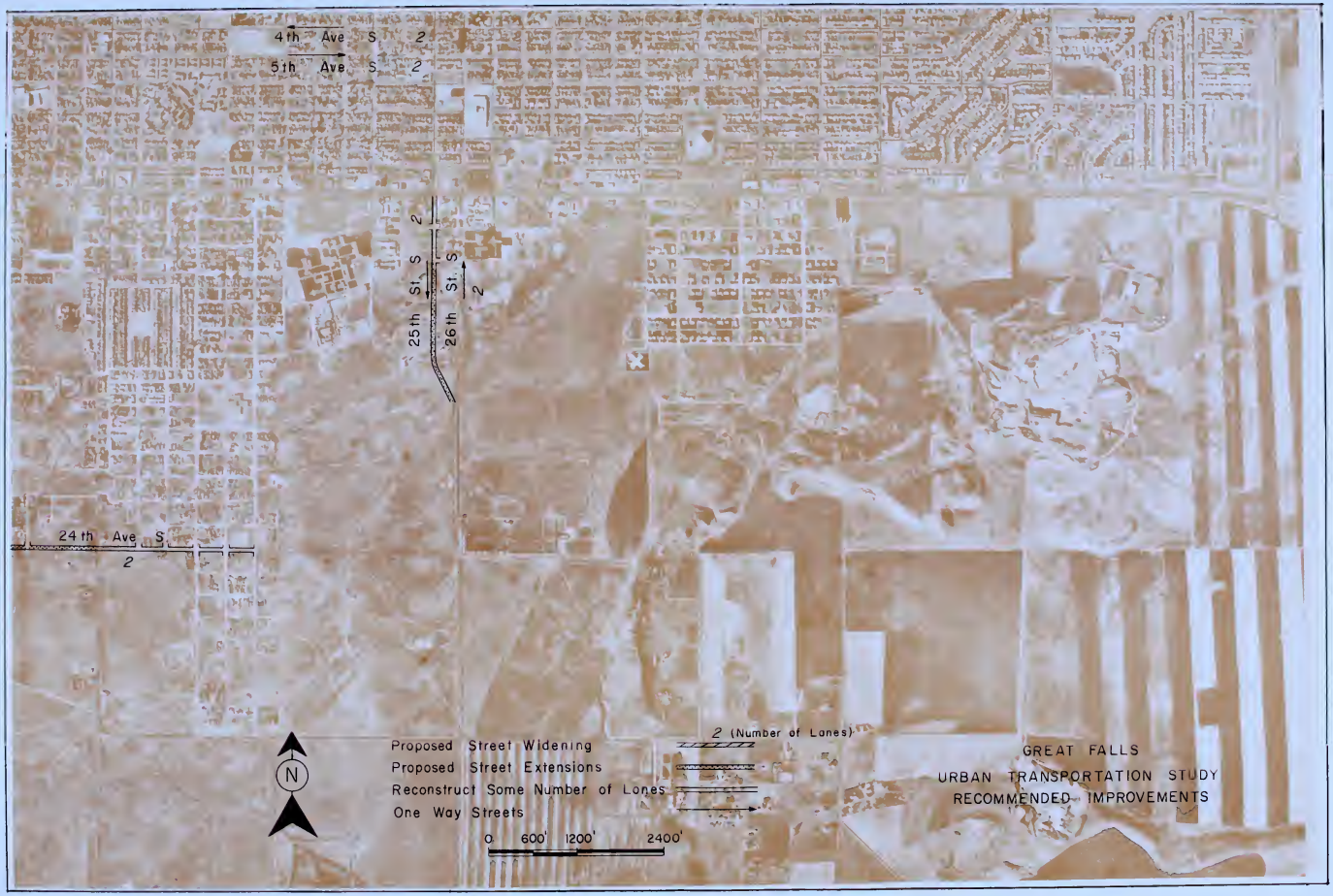
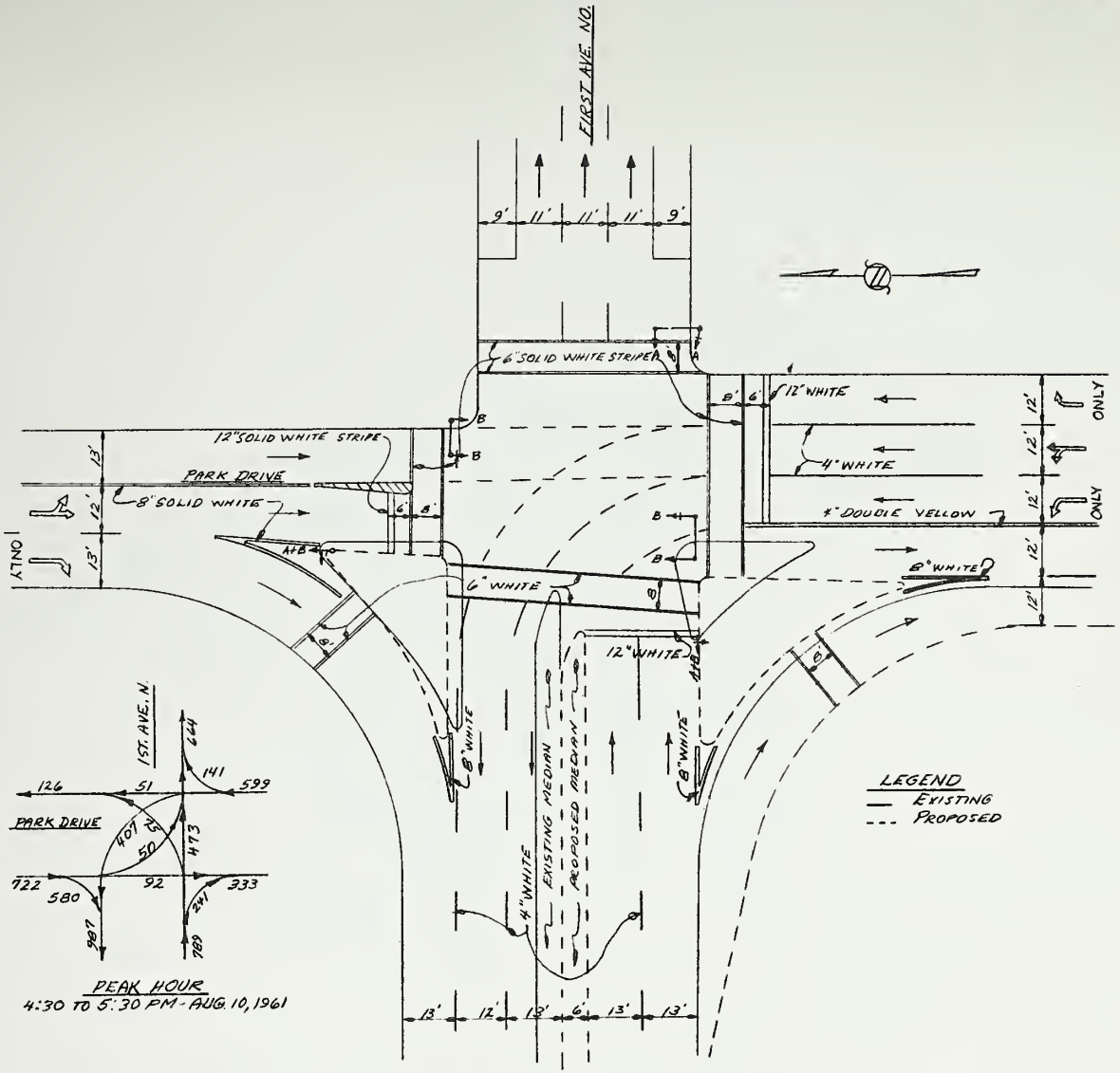
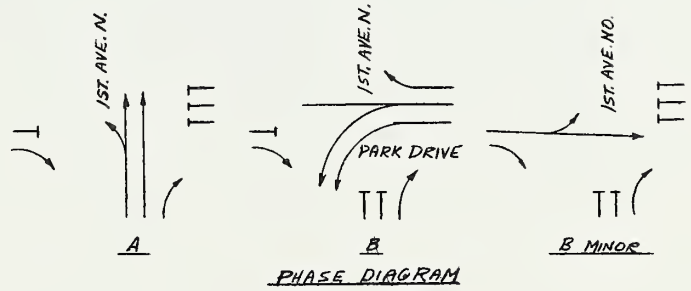

4th Ave S
2
5th Ave S
2
25th St. S
2
26th St. S
2
24th Ave S
2
N
Proposed Street Widening
Proposed Street Extensions
Reconstruct Some Number of Lanes
One Way Streets
2 (Number of Lanes)
0 600' 1200' 2400'
GREAT FALLS
URBAN TRANSPORTATION STUDY
RECOMMENDED IMPROVEMENTS

EXHIBIT 34





GREAT FALLS URBAN TRANSPORTATION STUDY
PROPOSED INTERSECTION TREATMENT
1ST AVE N. AND PARK DRIVE

EXHIBIT 35
127

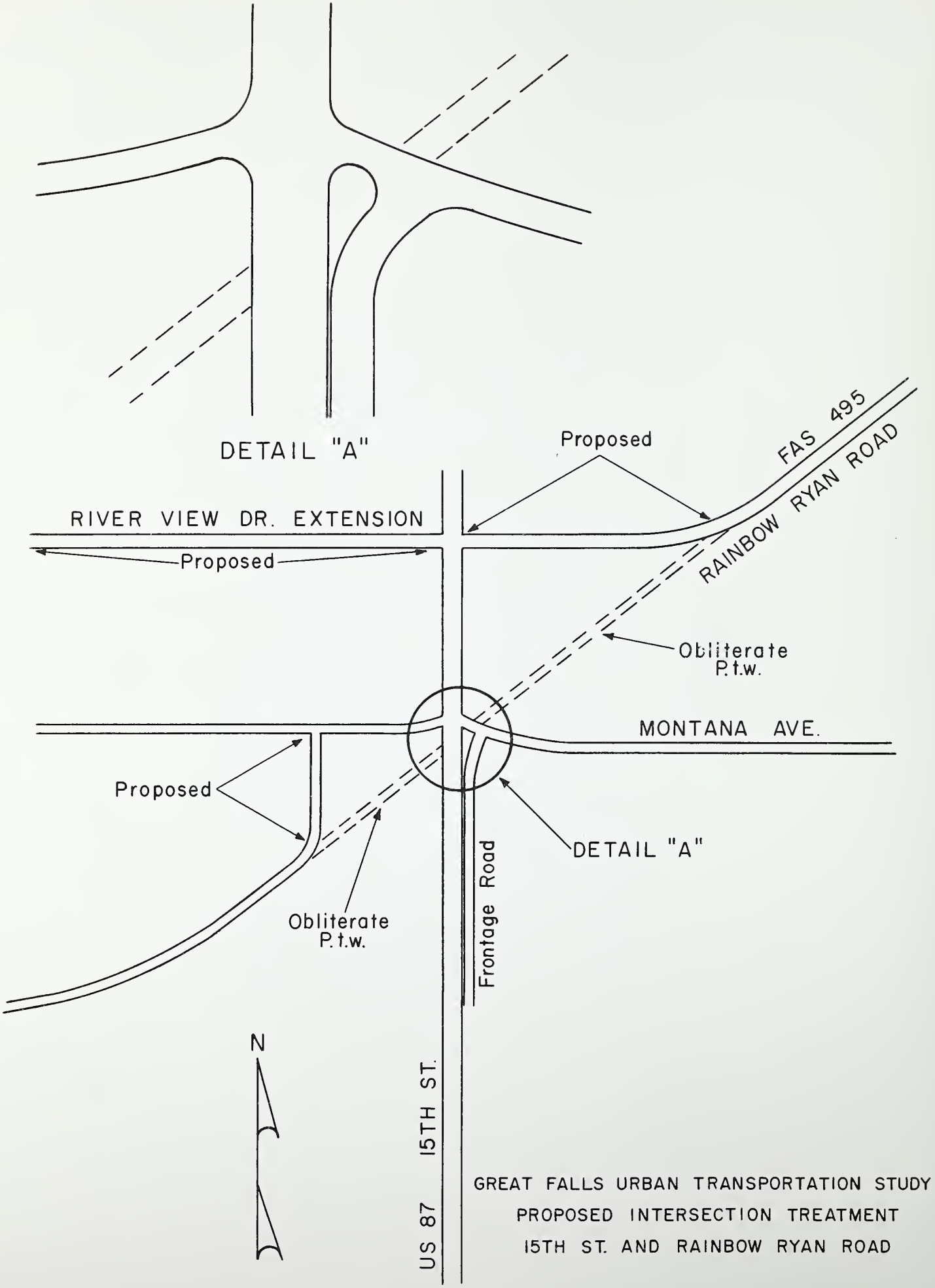
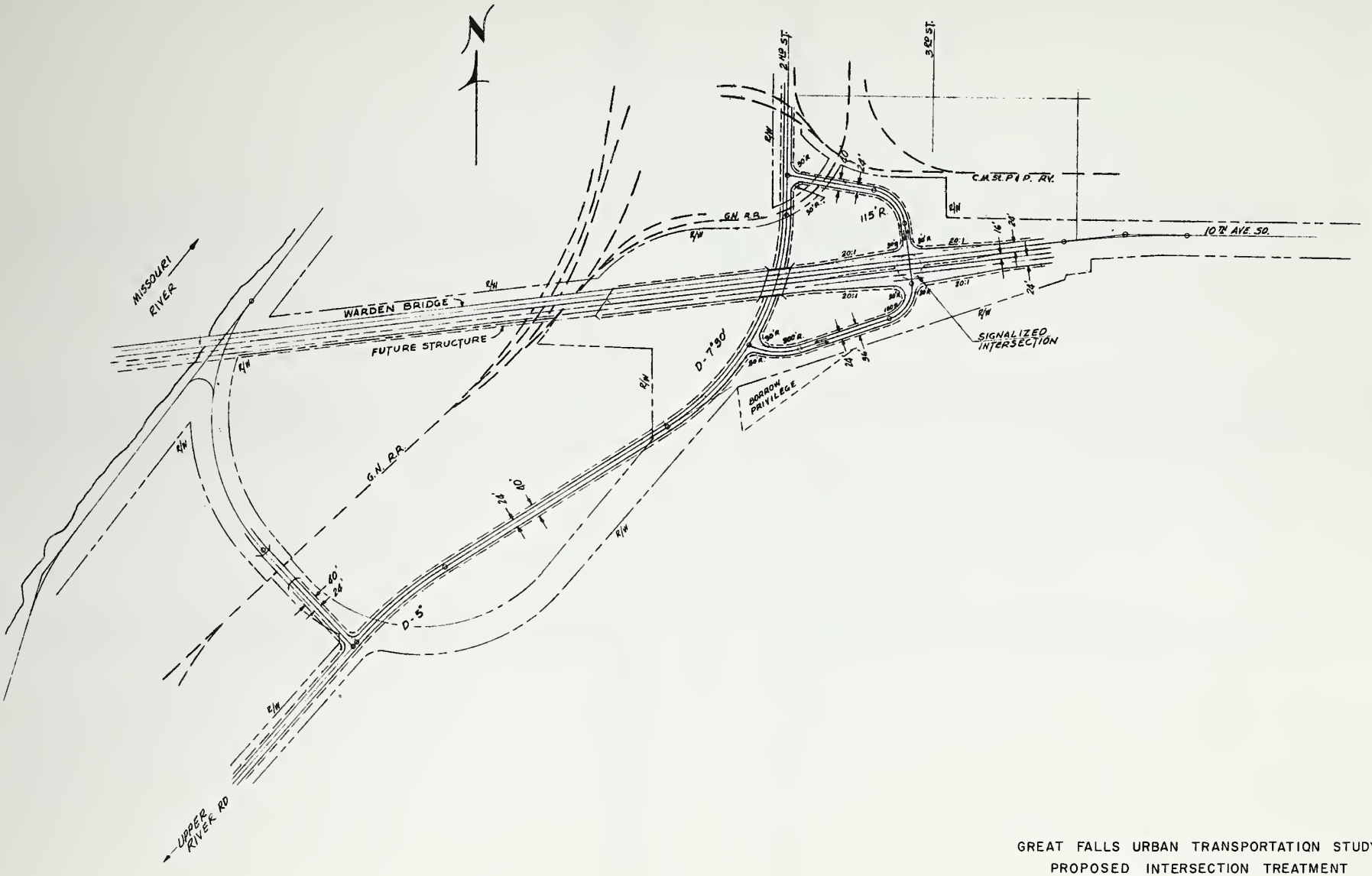

DETAIL "A"
Proposed
FAS 495
RAINBOW RYAN ROAD
RIVER VIEW DR. EXTENSION
Proposed
Obliterate
P.t.w.
MONTANA AVE.
Proposed
DETAIL "A"
Frontage Road
Obliterate
P.t.w.
N
15TH ST.
US 87
GREAT FALLS URBAN TRANSPORTATION STUDY
PROPOSED INTERSECTION TREATMENT
15TH ST. AND RAINBOW RYAN ROAD

EXHIBIT 36



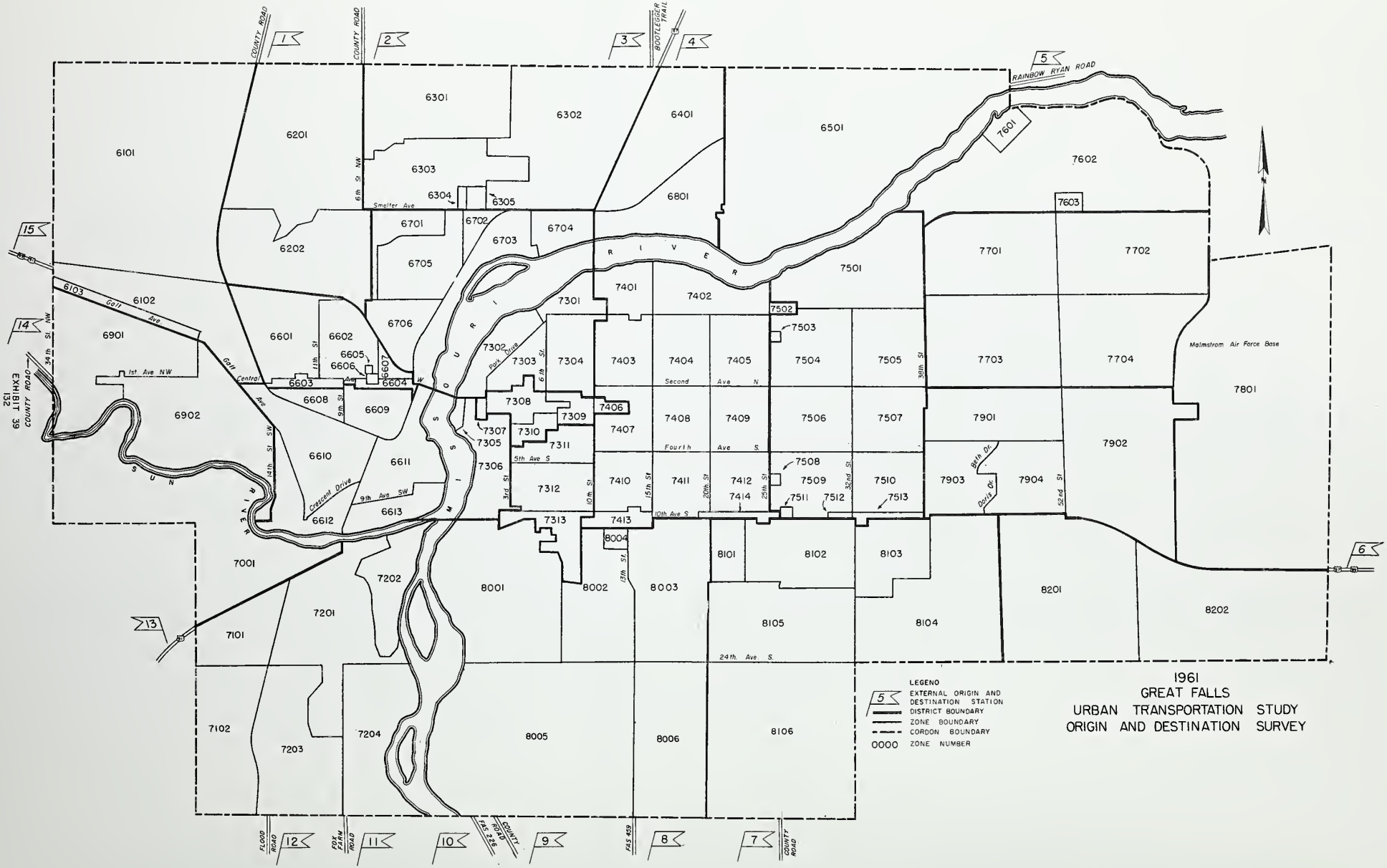
GREAT FALLS URBAN TRANSPORTATION STUDY
PROPOSED INTERSECTION TREATMENT
2ND ST. AND 10TH AVE S.

EXHIBIT 37

GREAT FALLS URBAN TRANSPORTATION STUDY
PROPOSED SIX LANE OPERATION
10 TH AVE SOUTH

EXHIBIT 38

Appendix


1961
GREAT FALLS
URBAN TRANSPORTATION STUDY
ORIGIN AND DESTINATION SURVEY
LEGEND
EXTERNAL ORIGIN AND DESTINATION STATION
DISTRICT BOUNDARY
ZONE BOUNDARY
CORDON BOUNDARY
0000 ZONE NUMBER
EXHIBIT 39
132
COUNTY ROAD
BOOTLEGGER TRAIL
RAINBOW RYAN ROAD
Smelter Ave
6th St NW
Gore Hill Road
Gore Hill Road
Gore Hill Road

GREAT FALLS URBAN TRANSPORTATION STUDY
GENERALIZED LAND USE BY TRAFFIC ZONE
1961 - 1981

		1961									1981								
CENTROID NUMBER	ZONE NUMBER	TOTAL ACRES	RESIDENT ACRES	COMMERCIAL ACRES	INDUSTRIAL ACRES	PUBLIC ACRES	STREETS ALLEYS ACRES	PERCENT DEVELOPED	NUMBER DWELLING UNITS	DWELLING UNITS PER ACRE	TOTAL ACRES	RESIDENT ACRES	COMMERCIAL ACRES	INDUSTRIAL ACRES	PUBLIC ACRES	STREETS ALLEYS ACRES	PERCENT DEVELOPED	NUMBER DWELLING UNITS	DWELLING UNITS PER NET ACRE
16	6101	864.0					5.3	1.4			864.0					5.3	1.4		
17	6102	304.0	8.5	2.0	100.0		27.0	43.0	28	3.3	220.0	8.5	12.0	100.1		40.0	73.0	28	3.3
121	6103										84.0			40.0		11.0	60.7		
18	6201	552.0	9.6					1.7	42	4.4	552.0	187.5				38.1	40.9	840	4.5
19	6202	384.0	41.3	2.8		19.6	23.5	24.3	196	4.7	384.0	140.6	2.8		19.6	28.7	49.9	703	5.0
20	6301	340.0	3.5			5.5	4.5	4.0	21	6.0	340.0	236.0			12.0	67.5	90.0	1180	5.0
21	6302	540.0	3.7		12.0		20.7	6.7	18	4.9	540.0	248.0		20.0	47.0	65.7	70.5	1116	4.5
22	6303	272.0	164.6			21.1	67.8	93.4	889	5.4	272.0	164.6			21.1	67.8	93.4	889	5.4
23	6304	7.3		4.4			0.9	67.1			7.3		4.4			0.9	67.1		
24	6305	13.7		7.5			0.6	59.1			13.7		7.5			0.6	59.1		
25	6401	324.0		16.0	22.0		17.7	17.2			324.0		16.0	62.0		17.7	29.7		
26	6501	1100.0	4.2		250.0	34.0	15.2	27.6	21	5.0	1100.0	4.2		250.0	34.0	15.2	27.6	21	5.0
27	6601	215.5	85.5	1.9		12.9	62.8	78.5	511	6.0	215.5	90.0	10.3		12.9	80.0	89.7	540	6.0
28	6602	128.0	48.1	0.5	3.1	8.3	40.2	79.3	476	9.9	128.0	60.0	10.9	3.1	8.3	40.2	96.0	536	8.9
29	6603	24.0	3.3	3.6	2.4		8.2	72.9	42	12.7	24.0		13.3	2.4		8.2	99.0		
30	6604	17.8	2.9	6.5	1.0	0.3	6.6	97.2	56	19.3	17.8		9.4	1.0	0.3	6.6	97.2		
31	6605	1.6		1.4			0.2	100.0			1.6		1.4			0.2	100.0		
32	6606	4.0		2.0	0.5		1.5	100.0			4.0		2.0	0.5		1.5	100.0		
33	6607	17.2	3.0	0.9	6.4		2.6	75.0	49	16.3	17.2	3.0	0.9	10.5		2.6	99.0	49	16.3
34	6608	43.2	16.9	0.7			10.3	64.6	154	9.1	43.2	16.9	0.7			10.3	64.6	154	9.0
35	6609	90.6	49.9	1.1		6.4	32.2	98.9	574	11.5	90.6	49.9	1.1		6.4	32.2	98.9	574	11.5
36	6610	228.0			96.0		1.7	42.8			228.0			96.0		1.7	42.8		
37	6611	172.0	7.2		100.5		11.2	69.1	35	4.9	172.0	7.2		112.5		11.2	76.1	35	4.9
38	6612	120.0	33.5	1.0	1.8		18.2	45.4	182	5.4	120.0	33.5	1.0	1.8		18.2	45.4	182	5.4
39	6613	84.0	22.1		0.7		9.5	38.4	112	5.1	84.0	22.1		0.7		9.5	38.4	112	5.1
40	6701	68.0	40.3			15.2	9.3	95.3	189	4.6	68.0	40.3			15.2	9.3	95.3	189	4.6
41	6702	28.0		0.9		12.4	4.4	63.2			28.0		11.2		12.4	4.4	100.0		
42	6703	152.0	3.9	1.5	56.6	10.8	10.3	54.7	28	7.2	152.0	3.9	1.5	67.0	10.8	10.3	61.5	28	7.2
43	6704	72.0			27.2		2.9	41.8			72.0		25.6	27.2		2.9	77.4		
44	6705	172.0			19.7		3.0	13.2			172.0	40.0	5.0	19.7	40.0	20.0	91.9	200	5.0
45	6706	92.0				92.0		100.0			92.0				92.0		100.0		
46	6801	212.0	45.9	3.0	22.1	3.7	45.6	56.7	427	9.3	212.0	45.9	3.0	22.1	3.7	45.6	56.7	427	9.3
47	6901	368.0	32.8	3.4		4.6	35.5	21.7	77	2.3	368.0	40.0	5.4		4.6	71.5	33.0	120	3.0
48	6902	404.0	55.2	2.8	7.4	2.8	47.7	28.7	385	7.0	404.0	45.0	5.0	7.4	2.8	84.0	35.7	315	7.0
49	7001	688.0	21.9	3.3	4.4		40.0	10.1	217	9.9	688.0	65.9	3.3	4.4		76.0	21.7	437	6.6
50	7101	152.0	1.2	1.1	7.3	0.5	11.1	13.9	7	5.8	152.0	22.0	1.1	7.3	1.5	13.0	29.5	110	5.0
116	7102										269.2	70.8				29.2	37.1	319	4.5
51	7201	368.0	42.8	6.6		7.3	50.8	31.5	259	6.1	368.0	227.9	18.8		22.3	62.0	90.0	1140	5.0
52	7202	136.0		1.1		128.3	6.6	100.0			136.0		1.1		128.3	6.6	100.0		
117	7203	NON EXISTANT									318.4	211.6				55.6	83.9	846	4.0
118	7204	NON EXISTANT									279.2	103.8				27.5	47.0	415	4.0
53	7301	60.0	3.6		23.2		10.1	61.5	13	3.6	60.0	3.6		23.2		10.1	61.5	13	3.6
54	7302	91.0	1.4	1.4	20.0	52.8	15.4	100.0	6	4.3	91.0	1.4	1.4	20.0	52.8	15.4	100.0	6	4.3
55	7303	70.3	35.5	2.7		2.1	29.0	98.6	1196	33.7	70.3	35.5	2.7		2.1	29.0	98.6	1196	33.7

GREAT FALLS URBAN TRANSPORTATION STUDY
GENERALIZED LAND USE BY TRAFFIC ZONE
1961 - 1981

		1961									1981								
CENTROID NUMBER	ZONE NUMBER	TOTAL ACRES	RESIDENT ACRES	COMMERCIAL ACRES	INDUSTRIAL ACRES	PUBLIC ACRES	STREETS ALLEYS ACRES	PERCENT DEVELOPED	NUMBER DWELLING UNITS	DWELLING UNITS PER ACRE	TOTAL ACRES	RESIDENT ACRES	COMMERCIAL ACRES	INDUSTRIAL ACRES	PUBLIC ACRES	STREETS ALLEYS ACRES	PERCENT DEVELOPED	NUMBER DWELLING UNITS	DWELLING UNITS PER NET ACRE
56	7304	114.7	58.6	2.2	2.9	5.9	44.1	99.1	1109	18.9	114.7	58.6	2.2	2.9	5.9	44.1	99.1	1109	18.9
57	7305	10.8				7.7	3.1	100.0			10.8				7.7	3.1	100.0		
58	7306	148.0	4.1	2.2	88.4	0.6	28.4	83.6	197	48.0	148.0	4.1	2.2	88.4	0.6	28.4	83.6	197	48.0
59	7307	7.3				5.2	2.1	100.0			7.3				5.2	2.1	100.0		
60	7308	63.6	3.8	30.3		4.0	25.5	100.0	639	168.2	63.6	3.8	30.3		4.0	25.5	100.0	639	168.2
61	7309	35.6	2.5	14.5	0.5	2.2	14.7	96.6	190	76.0	35.6	2.5	14.5	0.5	2.2	14.7	96.6	190	76.0
62	7310	29.7	2.3	8.1	3.3	0.9	13.7	95.3	170	73.9	29.7	2.3	8.1	3.3	0.9	13.7	95.3	170	73.9
63	7311	75.2	38.6	2.7	2.0		29.5	96.8	714	18.5	75.2	38.6	2.7	2.0		29.5	96.8	714	18.5
64	7312	122.7	69.8	1.9	0.6	0.2	47.8	98.0	1006	14.4	122.7	69.8	1.9	0.6	0.2	47.8	98.0	1006	14.4
65	7313	82.0	8.3	9.2	12.6		21.9	63.4	136	16.3	82.0	12.7	20.8	12.6		21.9	82.9	156	12.3
66	7401	85.4	2.5		45.6		11.0	69.2	13	5.2	85.4	2.5		50.0		11.0	74.3	13	5.2
67	7402	144.0	5.4	0.7	80.4	0.5	10.6	67.8	32	5.9	144.0	5.4	0.7	100.0	0.5	10.6	67.8	32	5.9
68	7403	124.6	68.2	2.2	0.5	3.5	48.5	98.6	878	12.9	124.6	68.2	2.2	0.5	3.5	48.5	98.6	878	12.9
69	7404	128.6	72.4	1.0		3.1	50.3	98.7	702	9.7	128.6	72.4	1.0		3.1	50.3	98.7	702	9.7
70	7405	128.6	65.2	0.5		9.7	49.0	96.7	617	9.5	128.6	65.2	0.5		9.7	49.0	96.7	617	9.5
71	7406	13.8	1.0	4.3		0.5	7.3	94.9	48	48.0	13.8	1.0	4.3		0.5	7.3	94.9	48	48.0
72	7407	104.8	45.6	3.9		12.9	40.9	98.5	673	14.8	104.8	45.6	3.9		12.9	40.9	98.5	673	14.8
73	7408	118.7	54.9	0.7		19.7	41.7	98.6	558	10.2	118.7	54.9	0.7		19.7	41.7	98.6	558	10.2
74	7409	118.6	59.4	0.8		13.6	42.9	98.4	407	6.9	118.6	59.4	0.8		13.6	42.9	98.4	407	6.9
75	7410	106.8	53.7	1.0		8.3	40.5	96.9	598	11.1	106.8	53.7	2.2		8.3	40.5	98.0	598	11.1
76	7411	116.7	65.0	1.0		8.7	36.5	95.3	653	10.0	116.7	65.0	4.6		8.7	36.5	98.2	653	10.0
77	7412	108.8	61.4				39.9	93.1	384	6.3	108.8	61.4				39.9	93.1	384	6.3
78	7413	36.0	4.8	16.8			11.1	90.8	238	49.6	36.0	4.8	18.3			11.1	90.8	238	49.6
79	7414	19.5		8.7			7.0	80.5			19.5		12.5			7.0	100.0		
80	7501	308.0				114.0	20.6	43.7			308.0			28.0	194.0	20.6	69.7		
81	7502	10.8			8.4		1.3	89.8			10.8			8.4		1.3	89.8		
82	7503	4.0		2.6			1.4	100.0			4.0		2.6			1.4	100.0		
83	7504	185.9	100.2		1.6	5.2	70.5	95.5	682	6.8	185.9	100.2		1.6	5.2	70.5	95.5	682	6.8
84	7505	166.0	90.5	0.7		0.3	61.4	92.1	572	6.3	166.0	90.5	0.7		0.3	61.4	92.1	572	6.3
85	7506	166.0	93.8	0.1		0.9	64.7	96.0	572	6.1	166.0	93.8	0.1		0.9	64.7	96.0	572	6.1
86	7507	142.4	69.1	1.6		9.9	49.7	91.4	372	5.4	142.4	69.1	1.6		9.9	49.7	91.4	372	5.4
87	7508	4.0		1.6			1.5	77.5			4.0		1.6			1.5	77.5		
88	7509	150.8	72.7	1.9		19.6	53.7	98.1	384	5.3	150.8	72.7	1.9		19.6	53.7	98.1	384	5.3
89	7510	129.2	77.4	0.8		7.2	39.7	96.8	325	4.2	129.2	77.4	0.8		11.3	39.7	100.0	325	4.2
90	7511	4.0		2.6			1.4	100.0			4.0		2.6			1.4	100.0		
91	7512	4.3		0.9			1.5	55.8			4.3		2.8			1.5	100.0		
92	7513	14.8		2.9			0.6	23.6			14.8		14.2			0.6	100.0		
93	7601	26.0	1.0			21.2	3.8	100.0	7	7.0	26.0	1.0			21.2	3.8	100.0	7	7.0
94	7602	708.0			21.3		25.2	6.6			708.0			85.0		25.2	15.6		
95	7603	10.0	1.2		8.8			100.0	6	5.0	10.0	1.2		8.8			100.0	6	5.0
96	7701	333.2	0.7		40.0		19.1	17.9	7	10.0	333.2	0.7		285.0		19.1	91.5	7	10.0
97	7702	388.0			14.8		17.6	8.3			388.0			92.0		17.6	28.2		
98	7703	384.0	53.5	2.7	4.1	10.6	43.9	29.9	306	5.7	384.0	216.2	25.9	4.1	28.2	71.2	90.0	1081	5.0
99	7704	344.0	5.4	2.7			13.8	6.4	26	4.8	344.0	152.4	10.7		16.0	47.5	87.1	914	6.0

GREAT FALLS URBAN TRANSPORTATION STUDY
GENERALIZED LAND USE BY TRAFFIC ZONE
1961 - 1981

		1961									1981								
CENTROID NUMBER	ZONE NUMBER	TOTAL ACRES	RESIDENT ACRES	COMMERCIAL ACRES	INDUSTRIAL ACRES	PUBLIC ACRES	STREETS ALLEYS ACRES	PERCENT DEVELOPED	NUMBER DWELLING UNITS	DWELLING UNITS PER ACRE	TOTAL ACRES	RESIDENT. ACRES	COMMERCIAL ACRES	INDUSTRIAL ACRES	PUBLIC ACRES	STREETS ALLEYS ACRES	PERCENT DEVELOPED	NUMBER DWELLING UNITS	DWELLING UNITS PER NET ACRE
100	7801	1436.0	115.5			1234.9	85.6	100.0	2052	17.8	1436.0	115.5			1234.9	85.6	100.0	2052	17.8
101	7901	234.0	19.6	13.5		68.2	21.9	52.7	124	6.3	234.0	93.2	17.5		77.4	38.3	96.8	559	6.0
102	7902	500.0	47.4	1.6			56.5	21.1	236	5.0	500.0	141.8	50.1		14.0	56.5	52.5	709	5.0
103	7903	152.0	98.1	0.9		2.0	41.9	94.0	443	4.5	152.0	98.1	9.0	1.0	2.0	41.9	100.0	443	4.5
104	7904	168.0	64.4			13.2	39.3	69.6	358	5.6	168.0	91.2	7.6		13.2	39.3	90.1	511	5.6
105	8001	481.6	53.0	10.0	17.1	26.1	57.4	34.0	292	5.5	481.6	254.2	10.0	17.1	30.1	141.4	94.0	1017	4.0
106	8002	264.0	20.9			12.1	32.8	24.9	108	5.2	264.0	119.3	3.0		50.1	42.0	81.2	477	4.0
107	8003	332.8	107.8	3.5		13.6	111.1	70.9	701	6.5	332.8	165.9	5.9	1.0	15.6	111.1	90.0	995	6.0
108	8004	16.0		11.2			1.1	76.9			16.0		11.2			1.1	76.9		
119	8005	NON EXISTANT									888.0	111.0				121.4	32.0	333	3.0
120	8006	NON EXISTANT									350.0	72.0	3.2			49.3	35.6	288	4.0
109	8101	68.0	1.8			20.3	3.1	37.1	12	6.7	68.0	1.8				3.1	100.0	12	6.7
110	8102	228.0	5.3	7.6	7.0		14.7	15.2	71	13.4	228.0	110.5	12.8	7.0	63.1	36.5	75.4	663	6.0
111	8103	160.0	12.7	4.1		1.4	47.0	40.8	59	4.6	160.0	81.1	8.1		5.0	47.0	100.0	374	4.6
112	8104	488.0					9.4	0.9			488.0	86.4	18.4		23.8	49.6	33.7	346	4.0
113	8105	348.0				27.7	7.8	10.2			348.0	100.0			27.7	32.9	46.1	400	4.0
	8106										691.2					31.0	4.5		
114	8201	620.0		23.9			12.6	5.9			620.0		55.6	49.6		12.6	20.6		
115	8202	560.0					16.7	3.0			560.0					16.7	3.0		
TOTAL		20,564.5	2,651.8	290.2	1,144.3	2,156.2	2,428.4	42.2	23,887	9.0	23,360.5	5,498.7	591.1	1,748.3	2,520.8	3,331.0	58.6	36,803	6.7

GREAT FALLS URBAN TRANSPORTATION STUDY
PASSENGER CARS PER DWELLING UNIT
1961 – 1981

Zone	1961 Number Dwelling Units	1961 Number Passenger Cars	1961 Pass Cars Per D. U	1981 Number Dwelling Units	1981 Number Passenger Cars	1981 Pass Cars Per D. U.
6101						
6102	28	49	1.8	28	50	1.8
SUB-TOTAL	28	49	1.8	28	50	1.8
6201	42	50	1.2	840	1260	1.5
6202	196	265	1.4	703	1055	1.5
SUB-TOTAL	238	315	1.3	1543	2315	1.5
6301	21	21	1.0	1180	1770	1.5
6302				1116	1674	1.5
6303	889	1252	1.4	889	1335	1.5
6304						
6305						
SUB-TOTAL	910	1273	1.4	3185	4779	1.5
6401						
6501				21	38	1.8
SUB-TOTAL				21	38	1.8

Zone	1961 Number Dwelling Units	1961 Number Passenger Cars	1961 Pass Cars Per D U	1981 Number Dwelling Units	1981 Number Passenger Cars	1981 Pass Cars Per D. U.
6601	511	664	1.3	540	756	1.4
6602	476	666	1.4	536	804	1.5
6603	42	42	1.0			
6604	56	73	1.3			
6605						
6606						
6607	49	64	1.3	49	79	1.6
6608	154	154	1.0	154	200	1.3
6609	574	574	1.0	574	746	1.3
6610						
6611	35	35	1.0	35	45	1.3
6612	182	237	1.3	182	255	1.4
6613	112	134	1.2	112	145	1.3
SUB-TOTAL	2191	2643	1.2	2182	3030	1.4
6701	189	246	1.3	189	265	1.4
6702						
6703	28	28	1.0	28	34	1.2
6704						

GREAT FALLS URBAN TRANSPORTATION STUDY
PASSENGER CARS PER DWELLING UNIT
1961 – 1981

Zone	1961 Number Dwelling Units	1961 Number Passenger Cars	1961 Pass Cars Per D. U	1981 Number Dwelling Units	1981 Number Passenger Cars	1981 Pass Cars Per D. U.
6705				200	280	1.4
6706						
SUB-TOTAL	217	274	1.3	417	579	1.4
6801	427	555	1.3	427	555	1.3
SUB-TOTAL	427	555	1.3	427	555	1.3
6901	77	116	1.5	120	180	1.5
6902	385	539	1.4	315	441	1.4
SUB-TOTAL	462	655	1.4	435	621	1.4
7001	217	303	1.4	437	655	1.5
SUB-TOTAL	217	303	1.4	437	655	1.5
7101	7	7	1.0	110	154	1.4
7102				319	510	1.6
SUB-TOTAL	7	7	1.0	429	664	1.5

Zone	1961 Number Dwelling Units	1961 Number Passenger Cars	1961 Pass Cars Per D U	1981 Number Dwelling Units	1981 Number Passenger Cars	1981 Pass Cars Per D. U.
7201	259	466	1.8	1140	2052	1.8
7202						
7203				846	1523	1.8
7204				415	705	1.7
SUB-TOTAL	259	466	1.8	2401	4280	1.8
7301	13	13	1.0	13	14	1.1
7302	6	12	2.0	6	8	1.3
7303	1196	962	0.8	1196	1196	1.0
7304	1109	966	0.9	1109	1109	1.0
7305						
7306	197	99	0.5	197	99	0.5
7307						
7308	639	256	0.4	639	256	0.4
7309	190	95	0.5	190	95	0.5
7310	170	34	0.2	170	34	0.2
7311	714	642	0.9	714	714	1.0
7312	1006	905	0.9	1006	1006	1.0
7313	136	150	1.1	156	187	1.2

GREAT FALLS URBAN TRANSPORTATION STUDY
PASSENGER CARS PER DWELLING UNIT
1961 – 1981

Zone	1961 Number Dwelling Units	1961 Number Passenger Cars	1961 Pass Cars Per D. U.	1981 Number Dwelling Units	1981 Number Passenger Cars	1981 Pass Cars Per D. U.
SUB-TOTAL	5376	4134	0.8	5396	4718	0.9
7401	13	16	1.2	13	17	1.3
7402	32	48	1.5	32	48	1.5
7403	878	966	1.1	878	1054	1.2
7404	702	772	1.1	702	842	1.2
7405	617	740	1.2	617	802	1.3
7406	48	38	0.8	48	48	1.0
7407	673	673	1.0	673	808	1.2
7408	558	725	1.3	558	781	1.4
7409	407	570	1.4	407	611	1.5
7410	598	770	1.3	598	837	1.4
7411	653	588	0.9	653	653	1.0
7412	384	499	1.3	384	538	1.4
7413	238	286	1.2	238	286	1.2
7414						
SUB-TOTAL	5801	6691	1.2	5801	7325	1.3

Zone	1961 Number Dwelling Units	1961 Number Passenger Cars	1961 Pass Cars Per D U	1981 Number Dwelling Units	1981 Number Passenger Cars	1981 Pass Cars Per D. U.
7501						
7502						
7503						
7504	682	1080	1.6	682	1159	1.7
7505	572	802	1.4	572	858	1.5
7506	572	744	1.3	572	858	1.5
7507	372	484	1.3	372	558	1.5
7508						
7509	384	576	1.5	384	614	1.6
7510	325	520	1.6	325	585	1.8
7511						
7512						
7513						
SUB-TOTAL	2907	4206	1.4	2907	4632	1.6
7601	7	7	1.0	7	10	1.4
7602						
7603	6	12	2.0	6	9	1.5
SUB-TOTAL	13	19	1.5	13	19	1.5

GREAT FALLS URBAN TRANSPORTATION STUDY
PASSENGER CARS PER DWELLING UNIT
1961 – 1981

Zone	1961 Number Dwelling Units	1961 Number Passenger Cars	1961 Pass Cars Per D. U.	1981 Number Dwelling Units	1981 Number Passenger Cars	1981 Pass Cars Per D. U.
7701				7	10	1.4
7702						
7703	306	405	1.3	1081	1621	1.5
7704				914	1371	1.5
SUB-TOTAL	306	405	1.3	2002	3002	1.5
7801	2052	1642	0.8	2052	1847	0.9
SUB-TOTAL	2052	1642	0.8	2052	1847	0.9
7901	124	146	1.2	559	727	1.3
7902	236	283	1.2	709	922	1.3
7903	443	665	1.5	443	709	1.6
7904	358	573	1.6	511	869	1.7
SUB-TOTAL	1161	1667	1.4	2222	3227	1.5
8001	292	426	1.5	1017	1526	1.5
8002	108	140	1.3	477	668	1.4
8003	701	1033	1.5	995	1592	1.6
8004						

Zone	1961 Number Dwelling Units	1961 Number Passenger Cars	1961 Pass Cars Per D. U.	1981 Number Dwelling Units	1981 Number Passenger Cars	1981 Pass Cars Per D. U.
8005				333	500	1.5
8006				288	432	1.5
SUB-TOTAL	1101	1599	1.4	3110	4718	1.5
8101	12			12	12	1.0
8102	71	83	1.2	663	862	1.3
8103	59	71	1.2	374	486	1.3
8104				346	519	1.5
8105				400	560	1.4
8106						
SUB-TOTAL	142	154	1.1	1795	2439	1.4
8201						
8202						
TOTALS	23815	27057	1.1	36803	49493	1.3

GREAT FALLS URBAN TRANSPORTATION STUDY
SUMMARY OF AUTO TRUCK & TAXI TRIPS
AVERAGE DAY 1981

Zone or Centroid of Destination

| ZONE NO | 6101 16 | 6102 17 | 6103 121 | 6201 18 | 6202 19 | 6301 20 | 6302 21 | 6303 22 | 6304 23 | 6305 24 | 6401 25 | 6501 26 | 6601 27 | 6602 28 | 6603 29 | 6604 30 | 6605 31 | 6606 32 | 6607 33 | 6608 34 | 6609 35 | 6610 36 | 6611 37 | 6612 38 | 6613 39 | 6701 40 | 6702 41 | 6703 42 | 6704 43 | 6705 44 | 6706 45 | 6801 46 | 6901 47 | 6902 48 | 7001 49 | 7101 50 | 7102 116 | 7201 51 | 7202 52 | 7203 117 | 7204 118 | 7301 53 | 7302 54 | 7303 55 | 7304 56 | 7305 57 | 7306 58 | 7307 59 | 7308 60 | 7309 61 | 7310 62 | 7311 63 | 7312 64 | 7313 65 | 7401 66 | 7402 67 | 7403 68 | 7404 69 | 7405 70 | 7406 71 | 7407 72 | 7408 73 | 7409 74 | ZONE NO |
|---|---|---

GREAT FALLS URBAN TRANSPORTATION STUDY
SUMMARY OF AUTO TRUCK & TAXI TRIPS
AVERAGE DAY 1981

Zone or Centroid of Destination

ZONE NO	7410 75	7411 76	7412 77	7413 78	7414 79	7501 80	7502 81	7503 82	7504 83	7505 84	7506 85	7507 86	7508 87	7509 88	7510 89	7511 90	7513 91	7514 92	7601 93	7602 94	7603 95	7701 96	7702 97	7703 98	7704 99	7801 100	7901 101	7902 102	7903 103	7904 104	8001 105	8002 106	8003 107	8004 108	8005 119	8006 120	8101 109	8102 110	8103 111	8104 112	8105 113	8201 114	8202 115	*SUB TOTAL
6101 16																																												4
6102 17	12	10	5	6	3	1		2	12	8	10	6		7	4	3		2				1		11	3	2	5	2	6	4	20	9	17	4	7	4	1	13	6	5	6			997
6103 121	5	5	2	3	1			1	5	3	4	3		2	2	1		1						4	1		1	1	2	2	9	5	8	2	3	2	1	6	3	2	3			414
6201 18	21	41	6	20	22	16	3	24	14	14	22	13	4	8	9	23	7	34	6	19	2	23	8	23	15	41	18	19	31	13	25	26	22	25	5	3	8	30	12	13	8	5		2693
6202 19	23	36	6	20	21	11	2	18	17	13	22	13	4	10	9	22	6	34	5	12	2	19	6	22	14	13	15	9	23	20	31	28	25	25	7	4	9	31	12	15	10	7		2819
6301 20	41	67	13	35	35	24	5	40	32	27	40	24	7	19	17	35	10	45	11	28	4	35	12	45	33	36	29	20	43	21	53	43	41	44	12	4	13	51	18	23	18	8		4885
6302 21	43	70	15	30	36	23	4	36	33	30	42	27	7	22	18	36	11	56	11	29	3	31	12	50	38	99	33	44	56	38	50	46	44	40	13	9	14	54	23	31	21	12		4464
6303 22	38	59	12	28	31	21	4	33	32	26	36	23	5	19	15	31	9	43	10	24	3	28	10	42	31	49	27	30	43	30	45	38	35	34	10	7	11	47	19	23	16	10		4269
6304 23	12	11	7	7	3	1		2	18	13	12	7		10	7	3		2		1		1	1	21	17	15	8	11	8	8	23	9	15	3	7	4	1	14	6	5	7	1		1276
6305 24	3	3	1	1	1				4	3	3	2		3	2	1								6	5	4	2	3	2	2	6	2	4	1	1			3	2	1	2			283
6401 25	6	5	3	3	2	1		1	7	5	5	4		4	3	1		1				1		9	7	5	5	6	3	4	7	4	9	2	2	2	1	6	3	2	3			445
6501 26	20	18	11	9	4	2		3	26	18	18	14		14	9	4		4	1	1		2	1	31	24	13	15	17	14	11	26	14	31	5	9	7	1	20	10	9	10	1		1353
6601 27	30	34	11	19	16	8	1	13	28	20	26	16	3	17	13	15	5	25	2	9	1	14	4	32	12	21	19	12	26	25	52	30	36	20	16	9	6	35	16	18	15	5		3187
6602 28	26	34	10	17	16	7	1	12	23	18	24	14	3	14	11	16	5	24	2	8	1	11	3	29	18	25	17	19	23	22	45	25	34	19	13	7	6	32	14	15	13	6		2791
6603 29	19	14	9	9	4	1		2	23	15	16	10	1	14	9	3		3		1		2		24	15	9	11	13	11	13	38	14	26	4	13	7	1	19	6	8	10	1		1759
6604 30	23	19	12	13	7	2		3	26	19	20	13	1	17	11	6		4		1		3	1	31	24	25	14	20	13	14	41	17	30	8	15	9	2	21	11	9	13	1		2079
6605 31	6	5	3	3	1	1		1	7	6	5	3		5	2	1		1				1		8	6	6	3	5	3	4	13	4	8	2	4	2		7	2	2	3			593
6606 32	11	10	6	8	3	1		2	13	10	11	7		9	6	3		2				2		16	11	11	7	10	7	8	22	8	16	4	8	5	1	18	6	5	7	1		1158
6607 33	4	4	2	3	1	1		1	3	2	3	2		2	1	1		2				1		5	3	5	3	3	3	3	5	3	6	2	2	1		4	2	2				348
6608 34	4	7	2	3	3	1		3	3	2	4	3		2	2	4	1	5		1		3	1	5	2	7	3	3	5	4	6	5	5	4	2	1	1	6	2	3	2	1		510
6609 35	20	30	7	16	17	7	2	11	14	12	18	11	3	9	8	17	5	27	2	9	1	13	4	21	14	37	14	17	24	21	29	22	24	19	7	5	6	27	6	14	10	7		2239
6610 36	4	3	2	3	1			1	4	2	3	2		2	1	1						1		4	2	3	2	3	2	2	5	2	6	2	2	1		4	2	2	2			286
6611 37	20	19	9	11	6	2		3	18	13	14	11	1	13	9	6	1	6		1		2	1	21	14	15	11	15	14	15	30	16	29	8	10	8	2	22	11	10	11	2		1520
6612 38	8	13	2	7	7	2		4	4	3	6	4	1	3	4	7	2	13		1		4		6	3	13	5	6	10	9	11	9	9	9	2	2	3	10	5	6	4	3		752
6613 39	4	7	1	3	4	1		1	2	1	3	2		2	1	3	1	7		1		2		2	2	6	2	3	6	4	5	4	4	4	1		1	5	6	2	2	1		231
6701 40	7	11	2	5	5	3		5	5	6	7	4		3	3	5	1	8	1	4		5	1	9	6	15	6	7	8	5	8	7	6	6	2	1	2	9		3	2			779
6702 41	8	8	5	3	1				13	10	8	6		7	5	1						1		16	14	8	6	9	6	6	19	6	13	1	7	4		9	6	3	5			752
6703 42	11	10	6	7	4	2		3	12	9	10	6		7	5	4		3		1		2	1	16	13	11	7	9	7	7	18	8	15	5	6	4	1	12	2	5	5	1		1016
6704 43	18	15	10	9	4	1		2	25	18	17	11		15	9	3		2		1		2	1	31	26	21	14	18	12	13	28	12	26	4	9	7	1	18	9	8	10	1		1408
6705 44	14	15	6	8	6	3		5	15	12	12	7		8	6	6	1	8	1	4		5	2	20	14	19	10	12	11	10	26	11	17	7	8	4	1	17	7	7	3			1335
6706 45	14	11	7	6	2	1		1	18	12	11	7		10	7	2		1				1		18	15	11	9	10	8	9	30	9	19	2	10	5	1	13	6	5	7			1163
6801 46	25	32	10	17	14	9	1	14	27	21	25	14	3	16	11	14	4	22	4	11	1	13	4	33	27	49	18	25	26	20	31	22	28	16	8	6	5	28	12	14	12	5		2303
6901 47	7	8	3	5	4	2		3	5	2	6	3		3	3	4	1	6				3		2	1	2	2	1	3	3	11	7	10	5	2	2	2	8	1	4	3			649
6902 48	16	23	7	14	13	5	1	7	12	10	14	8	2	8	7	14	4	19	1	3		8	1	13	3	7	8	7	16	16	26	17	23	15	7	4	5	22	10	11	9	5		1700
7001 49	20	31	6	15	16	5		9	12	9	15	10	3	9	8	17	5	30	2	4		6	2	15	12	31	13	19	28	23	27	22	24	19	6	5	7	24	11	17	10	7		1763
7101 50	8	11	3	5	4	1		2	5	4	6	3		5	4	5	1	8		1		2		6	5	13	5	7	9	8	14	8	10	5	4	3	2	9	4	6	5	1		664
7102 116	15	25	5	12	14	4	1	7	8	6	12	7	3	6	6	15	4	24	1	2		3	1	8	6	18	8	13	21	16	20	18	17	17	4	3	6	20	6	13	7	5		1336
7201 51	56	96	18	41	51	15	4	28	31	27	45	26	9	27	24	58	15	105	6	11	2	23	7	44	36	110	36	52	86	72	83	67	69	59	19	14	23	76	33	51	31	24		5448
7202 52	11	9	6	6	2	1		1	12	8	8	6		9	6	2		1				1		13	11	13	7	10	7	9	24	8	16	4	7	5	1	12	4	6	7			885
7203 117	40	76	12	33	43	12	2	24	18	15	31	19	8	15	15	46	13	78	3	6	1	11	4	21	17	47	25	35	63	47	51	52	47	51	10	8	18	56	24	38	22	17		3781
7204 118	19	33	5	16	20	6	1	10	8	7	15	8	4	7	7	21	6	36	1	2		5	2	10	8	24	10	17	27	22	25	24	23	22	5	4	8	26	11	15	9	8		1700
7301 53	9	9	4	6	4	2		3	11	8	9	6		6	4	4		2		1		2	1	13	11	12	6	9	6	6	10	7	12	5	4	3	1	10	6	4	5	1		693
7302 54	7	6	4	4	2	1		1	9	6	6	4		5	3	2		2				1		10	8	9	5	8	5	5	12	5	8	3	4	2	1	7	1	2	4			527
7303 55	36	44	15	24	21	11	2	17	34	28	33	22	4	24	17	21	6	32	5	13	2	14	5	47	37	69	28	38	39	33	51	31	44	25	15	11	8	41	19	23	19	8		3165
7304 56	58	66	24	40	30	15	4	24	54	43	52	34	5	36	26	28	7	41	6	16	4	23	8	72	54	110	39	57	52	48	69	47	65	34	20	17	12	63	30	31	27	11		4633
7305 57	3	2	1	1					3	2	1	1		2	1									4	3	3	1	2	1	1	6	1	4		1	1		2	1	1	1			148
7306 58	73	62	34	53	26	8	1	11	61	46	53	39	3	45	29	22	3	16	1	4	1	10	3	80	65	69	37	57	41	47	120	55	98	32	33	24	9	71	37	28	36	7		4926
7307 59	21	16	11	9	2	1		1	23	16	17	11		15	10	2		1				1		27	23	16	13	17	13	14	39	13	31	3	12	8	1	19	10	9	11			1226
7308 60	332	301	174	190	95	34	4	52	360	265	309	203	15	258	162	92	12	69	11	16	7	49	14	424	322	346	197	276	203	224	518	230	427	117	171	118	35	339	166	137	176	26		21798
7309 61	83	77	43	52	30	10	1	15	85	64	73	51	4	63	40	27	3	23	3	5	2	14	4	99	74	95	50	71	53	58	115	59	107	33	36	29	11	83	43	36	44	8		5268
7310 62	46	45	24	29	18	7		11	45	34	42	30	3	32	22	17	2	15	2	4	1	9	3	57	44	51	28	40	30	33	55	32	55	22	18	16	6	46	24	20	23	5		3062
7311 63	40	42	16	26	20	8	1	12	30	24	32	21	3	23	17	19	5	27	3	8	1	12	4	41	31	61	24	32	33	32	52	33	43	25	14	12	8	42	23	21	19	7		2691
7312 64	105	90	22	56	38	13	2	21	34	30	42	25	6	28	24	38	10	59	5	16	2	20	7	50	41	106	33	52	59	54	115	79	63	67	17	15	17	68	29	35	28	15		4222
7313 65	92	67	33	68	26	6	1	9	57	44	48	32	4	47	33	28	4	19	2	5	2	10	3	75	69	87	37	59	44	49	156	89	106	47	32	26	11	87	35	31	39	7		4350
7401 66	12	12	6	7	5	2		5	16	11	12	8	1	9	6	4		4		1		3	1	18	14	16	9	12	9	8	14	8	18	5	5	4	1	34	6	5	7	1		876
7402 67	22	25	13	14	10	7	1	12	37	22	28	16	2	17	11	10	1	8	1	3	1	8	2	35	27	32	15	22	15	16	22	13	28	11	7	8	4	26	12	9	13	3		1643
7403 68	38	52	15	24	21	11	3	23	39	28	38	23	4	24	19	22	7	34	5	14	2	19	6	47	39	85	29	42	42	36	44	30	43	23	12	11	9	43	21	24	19	9		3139
7404 69	52	68	26	30	33	20	5	37	90	46	66	37	5	36	28	31	9	44	6	17	4	26	9	77	57	120	41	60	55	51	57	38	64	29	17	17	13	71	31	32	28	12		4246
7405 70	32	52	16	23	28	17	4	44	75	39	60	25	6	26	19	27	9	43	5	16	2	23	7	49	37	92	32	45	47	39	35	27	41	24	9	11	11	4	23	26	20	12		3001
7406 71	32	32	16	19	13	4		6	36	25	31	20	2	25	16	10	2	10	1	2		5	1	44	35	41	21	31	22	24	43	22	39	13	13	11	4	34	16	14	17	3		2046
7407 72	53	73	25	30	29	11	3	20	44	34	55	30	6	32	22	29	8	44	5	14	2	17	6	52	44	92	34	49	50	45	52	41	58	31	14	13	11	58	25	29	24	11		3630
7408 73	61	86	28	25	32	11	2	23	49	33	63	32	8	36	22	33	8	44	5	14	2	17	6	49	40	87	31	45	48	42	42	32	49	27	11	13	11	63	22	28	24	10		3179
7409 74	37	51	22	21	34	10	2	25	48	30	66	34	6	35	21	35	7	35	4	11	1	14	5	41	31	69	26	37	42	35	32	23	38	23	8	10	11	63	20	24	23	9		2516

Zone or Centroid of Origin

External Stations

ZONE NO	1	2	3	4	5	8	7	6	9	10	11	12	13	14	15	SUB TOTAL	GRAND TOTAL
6101 16													1		2	3	7
6102 17			1	8		1	2	5	1	7			31	3	163	222	1159
6103 121			1	4			1	3	1	4			17	2	24	57	471
6201 18			2	17	1	4	2	8	2	11			38	3	51	139	2812
6202 19			2	20	1	6	3	12	2	17			59	5	80	207	3026
6301 20			5	39	2	11	5	18	4	29			94	7	125	339	5224
6302 21			6	45	2	34	5	15	3	21			66	5	81	283	4747
6303 22			5	37	2	28	5	16	3	24			77	5	102	304	4573
6304 23			2	16	1	11	2	6	1	8			25	2	31	105	1381
6305 24				3		3		1		2			5		6	20	313
6401 25			3	22		7	1	3	1	4			12	1	16	70	515
6501 26			2	14	1	11	2	6	1	7			25	2	31	102	1455
6601 27			2	15	1	16	3	10	2	14			60	5	137	265	3452
6602 28			1	13	1	13	2	9	1	12			44	4	73	173	2964
6603 29			1	11	1	14	2	7	1	10			41	4	74	166	1925
6604 30			3	22	1	22	4	12	2	17			76	5	83	247	2326
6605 31			1	4		5	1	2	1	4			16	1	20	55	648
6606 32			1	10		13	2	6	1	9			39	2	49	122	1290
6607 33				3		4	1	2		3			11	1	14	29	387
6608 34				2		3	1	2		2			11	1	19	41	551
6609 35			1	11	1	15	2	8	1	10			48	3	52	152	2391
6610 36				3		5	1	2		3			19	1	14	48	234
6611 37			2	13	1	22	3	10	2	13			77	3	58	204	1724
6612 38			1	5		8	1	4	1	5			36	2	26	89	841
6613 39				1		3		1		2			11		6	24	355
6701 40			1	8		5	1	3	1	5			17	1	21	63	842
6702 41			1	5		4	1	2		3			9	1	11	37	789
6703 42			2	14	1	10	2	6	1	10			24	2	43	125	1141
6704 43			3	21	1	15	2	6	1	8			25	2	30	114	1522
6705 44			1	9		6	1	4	1	6			19	1	25	73	1408
6706 45			1	8		7	1	4	1	6			19	1	24	72	1235
6801 46			3	26	1	19	3	9	2	11			35	2	44	155	2458
6901 47			1	4		1	1	3	1	4			18	6	26	65	714
6902 48			1	11	1	12	3	8	1	10			55	6	69	177	1877
7001 49			1	7		14	2	7	1	8			118	2	32	192	1955
7101 50				2		4	1	2		3			40	1	11	64	728
7102 116			1	6		11	2	5	1	7			55	2	29	119	1455
7201 51			2	17	1	32	5	15	3	19			132	4	70	300	5748
7202 52			1	5		11	1	5	1	6			86	1	22	139	1024
7203 117			2	14	1	24	4	12	2	16			117	3	62	257	4038
7204 118			1	7		13	2	6	1	8			40	2	30	110	1810
7301 53			1	9		13	2	6	1	7			38	1	22	80	773
7302 54			1	5		8	1	3	1	5			13	1	16	54	581
7303 55			3	20	1	33	5	15	3	21			51	3	60	215	3380
7304 56			4	34	2	55	8	26	4	30			79	5	89	336	4969
7305 57				1		1		1		1			2		2	8	156
7306 58			5	40	2	84	13	42	8	52			146	9	150	551	5477
7307 59			1	4		8	1	4	1	5			14	1	16	55	1281
7308 60			24	179	30	329	55	167	32	212			559	36	638	2261	24059
7309 61			7	50	8	100	15	47	8	54			149	10	166	614	5982
7310 62			4	32	9	63	10	30	5	34			93	6	100	386	3448
7311 63			3	19	2	41	6	19	3	24			64	3	68	252	2943
7312 64			2	21	2	48	7	27	4	30			79	4	71	295	4517
7313 65			4	28	3	71	12	43	6	41			109	6	99	422	4772
7401 66			1	10	1	16	2	7	1	8			21	1	25	93	969
7402 67			2	18	1	36	5	14	2	16			41	3	49	187	1830
7403 68			2	18	1	31	5	13	2	16			40	2	47	177	3316
7404 69			3	24	2	51	8	20	3	22			60	4	70	267	4513
7405 70			2	16	2	34	5	13	2	14			37	2	43	170	3171
7406 71			2	16	2	32	5	14	3	17			45	3	50	189	2235
7407 72			2	19	1	40	6	18	3	20			52	3	58	222	3852
7408 73			2	14	1	33	5	14	2	14			37	2	44	168	3247
7409 74			2	13	1	34	5	13	2	13			35	2	40	160	2676

GREAT FALLS URBAN TRANSPORTATION STUDY
SUMMARY OF AUTO TRUCK & TAXI TRIPS
AVERAGE DAY 1981

Zone or Centroid of Destination

ZONE NO	6101 16	6102 17	6103 121	6201 18	6202 19	6301 20	6302 21	6303 22	6304 23	6305 24	6401 25	6501 26	6601 27	6602 28	6603 29	6604 30	6605 31	6606 32	6607 33	6608 34	6609 35	6610 36	6611 37	6612 38	6613 39	6701 40	6702 41	6703 42	6704 43	6705 44	6706 45	6801 46	6901 47	6902 48	7001 49	7101 50	7102 116	7201 51	7202 52	7203 117	7204 118	7301 53	7302 54	7303 55	7304 56	7305 57	7306 58	7307 59	7308 60	7309 61	7310 62	7311 63	7312 64	7313 65	7401 66	7402 67	7403 68	7404 69	7405 70	7406 71	7407 72	7408 73	7409 74	ZONE NO
7410 75		12	6	21	23	41	43	38	12	3	6	20	30	26	19	23	6	11	4	4	20	4	20	8	4	7	8	11	18	14	14	25	7	16	20	8	15	56	11	40	19	9	7	26	58	1	73	21	332	83	46	40	105	92	12	22	38	52	22	32	53	61	37	7410 75
7411 76		10	5	41	36	67	70	59	11	3	5	38	34	34	14	19	5	10	4	7	30	3	19	13	7	11	8	10	15	15	11	32	8	23	31	11	25	96	9	76	33	9	6	44	66	2	62	16	301	77	45	42	90	67	12	25	52	68	52	32	73	86	51	7411 76
7412 77		5	2	6	6	13	15	12	7	1	3	11	11	10	9	12	3	6	2	2	7	2	9	2	1	2	5	6	10	6	7	10	3	7	6	3	5	18	6	12	5	4	4	15	24	1	34	11	174	43	24	16	22	33	6	13	15	26	16	16	25	28	22	7412 77
7413 78		6	1	20	20	35	30	28	7	1	3	9	19	17	9	13	3	8	3	3	16	3	11	7	3	5	3	7	9	8	6	17	5	14	15	5	12	41	6	33	16	6	4	24	40	1	53	9	190	52	29	26	56	68	7	14	24	30	23	19	30	25	21	7413 78
7414 79		3	1	22	21	35	36	31	3	1	2	4	16	16	4	7	1	3	1	3	17	1	6	7	4	5	1	4	4	6	2	14	4	13	16	4	14	51	2	43	20	4	2	21	30		26	2	95	30	18	20	38	26	5	10	21	33	28	11	29	32	34	7414 79
7501 80		1		16	11	24	23	21	1		1	4	8	7	1	2	1	1	1	1	7		2	2	1	3		2	1	3	1	9	2	5	5	1	4	15	1	12	6	2	1	11	15		8	1	34	10	7	8	13	6	2	7	11	20	17	4	11	11	10	7501 80
7502 81				3	2	5	4	4					1	1							2											1		1			1	4	2	1				2	4		1		4	1		1	2	1		1	3	5	4		3	2	2	7502 81
7503 82		2	1	24	18	40	36	33	2		1	9	13	12	2	3	1	2	1	3	11	1	3	4	1	5		3	2	5	1	14	3	7	9	2	7	28	1	24	10	3	1	17	24		11	1	52	15	11	12	21	9	5	12	23	37	44	6	20	23	25	7503 82
7504 83		12	5	14	17	32	33	32	18	4	7	26	28	23	23	26	7	13	3	3	14	4	18	4	2	5	13	12	25	15	18	27	5	12	12	5	8	31	12	18	8	11	9	34	54	3	61	23	360	85	45	30	34	57	16	37	39	90	75	36	44	49	48	7504 83
7505 84		8	3	14	13	27	30	26	13	3	5	18	20	18	15	19	6	10	2	2	12	2	13	3	1	6	10	9	18	12	12	21	2	10	9	4	6	27	8	15	7	8	6	28	43	2	46	16	265	64	34	24	30	44	11	22	28	46	39	25	34	33	30	7505 84
7506 85		10	1	22	22	40	42	36	12	3	5	18	26	24	16	20	5	11	3	4	18	3	14	6	3	7	8	10	17	12	11	25	6	14	15	6	12	45	8	31	15	9	6	33	52	1	53	17	309	73	42	32	42	48	12	28	38	66	60	31	55	63	66	7506 85
7507 86		6	3	13	13	24	27	23	7	2	4	14	16	14	10	13	3	7	2	3	11	2	11	4	2	4	6	6	11	7	7	14	3	8	10	3	7	26	6	19	8	6	4	22	34	1	39	11	203	51	30	21	25	32	8	16	23	37	25	20	30	32	34	7507 86
7508 87				4	4	7	7	5					3	3	1	1					3		1	1								3		2	3		3	9		8	4			4	5		3		15	4	3	3	6	4	1	2	4	5	6	2	6	8	6	7508 87
7509 88		7	2	8	10	19	22	19	10	3	4	14	17	14	14	17	5	9	2	2	9	2	13	3	2	3	7	7	15	8	10	16	3	8	9	5	6	27	9	15	7	6	5	24	36	2	45	15	258	61	32	23	28	47	9	17	24	36	26	25	32	36	35	7509 88
7510 89		4	2	8	9	17	18	15	7	2	3	9	13	11	9	11	2	6	1	2	8	1	9	4	1	3	5	5	9	6	7	11	3	7	8	4	6	24	6	15	7	4	3	17	26	1	29	10	162	40	22	17	24	33	6	11	19	28	19	16	22	22	21	7510 89
7511 90		3	3	23	22	35	36	31	3	1	3	4	15	16	3	6	1	3	1	4	17	1	6	7	3	5	1	4	3	6	2	14	4	14	17	5	15	58	2	46	21	4	2	21	28		22	2	92	27	17	19	38	28	4	10	22	31	27	10	29	33	35	7511 90
7512 91				7	6	10	11	9					5	5						1	5		1	2	1	1				1		4	1	4	5	1	4	15		13	6			6	7		3		12	3	2	5	10	4		1	7	9	9	2	8	8	7	7512 91
7513 92		2	1	34	24	45	56	43	2		1	1	25	24	3	4	1	2	2	5	27		6	13	7	8		3	2	8	1	22	6	19	30	8	24	105	1	78	36	2	2	32	41		16	1	69	23	15	27	59	19	4	8	34	44	43	10	44	44	35	7513 92
7601 93				4	5	11	11	10				1	2	2							2					1				1		4		1	2		1	6		3	1			5	6		1		11	3	2	3	5	2		3	5	6	5	1	5	5	4	7601 93
7602 94				19	12	28	29	24	1			1	9	8	1	1				1	9		1	1	1	4		1	1	4		11		3	4	1	2	11		6	2	1		13	16		4		16	5	4	8	16	5	1	3	14	17	16	2	14	14	11	7602 94
7603 95				2	2	4	2	3					1	1							1											1							2		1				2	4		1		7	2	1	1	2	2		1	2	4	2		2	2	1	7603 95
7701 96		1		23	19	35	31	28	1		1	2	14	11	2	3	1	2	1	3	13	1	2	4	2	5	1	2	2	5	1	13	3	8	6	2	3	23	1	11	5	2	1	14	23		10	1	49	14	9	12	20	10	3	8	19	26	23	5	17	17	14	7701 96
7702 97				8	6	12	12	10	1			1	4	3		1				1	4		1			1		1	1	2		4		1	2		1	7		4	2	1		5	8		3		14	4	3	4	7	3	1	2	6	9	7	1	6	6	5	7702 97
7703 98		11	4	23	22	45	50	42	21	6	9	31	32	29	24	31	8	16	5	5	21	4	21	6	2	9	16	16	31	20	18	33	2	13	15	6	8	44	13	21	10	13	10	47	72	4	80	27	424	99	57	41	50	75	18	35	47	77	49	44	52	49	41	7703 98
7704 99		3	1	35	14	23	38	31	17	5	7	24	12	18	15	24	6	11	3	2	14	2	14	3	2	6	14	13	26	14	15	27	1	3	12	5	6	26	11	17	8	11	8	27	54	2	63	23	322	74	44	31	41	69	14	27	39	59	37	35	44	40	31	7704 99
7801 100		2		41	13	36	99	49	15	4	5	13	21	25	9	25	6	11	5	7	37	3	15	13	6	15	8	11	21	19	11	49	2	7	31	13	18	110	13	47	24	12	9	69	110	3	69	16	346	95	51	61	106	87	16	32	85	120	92	43	92	87	69	7801 100
7901 101		3	1	18	15	29	33	27	8	2	5	15	19	17	11	14	3	7	3	3	14	2	11	5	2	6	6	7	14	10	9	18	2	8	13	5	8	36	7	25	10	6	5	28	39	1	37	13	197	50	28	24	33	37	9	15	29	41	32	21	34	31	26	7901 101
7902 102		2	1	38	9	20	44	30	11	3	6	17	12	19	13	20	5	10	3	3	17	3	15	6	3	7	9	9	18	12	10	25	1	7	19	7	13	52	10	35	17	9	8	38	57	2	27	17	276	71	40	32	52	59	12	22	42	60	45	31	49	45	37	7902 102
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7904 104		4	3	13	20	21	38	30	8	2	6	11	25	22	13	14	4	8	3	4	21	2	15	9	4	5	6	7	13	10	9	20	3	16	23	8	16	72	9	47	22	6	5	33	48	1	47	14	224	58	33	32	54	49	8	16	36	51	39	24	45	42	35	7904 104
8001 105		20	3	25	31	53	50	45	23	6	7	26	52	45	38	41	13	22	5	6	29	5	30	11	5	8	19	18	28	26	30	31	11	26	27	14	20	83	24	51	25	10	12	51	69	6	120	39	518	115	55	52	113	156	14	22	44	57	35	43	52	42	32	8001 105
8002 106		9	3	26	28	43	46	38	9	2	4	14	30	25	14	17	4	8	3	5	22	2	16	9	4	7	6	8	12	11	9	22	7	17	22	8	18	67	8	52	24	7	5	31	47	1	55	13	230	59	32	33	79	89	8	13	30	38	27	22	41	32	23	8002 106
8003 107		17	3	22	25	41	44	35	15	4	3	31	34	34	26	30	8	16	6	5	24	6	29	9	4	6	13	15	26	17	19	28	10	23	24	10	17	69	16	47	23	12	8	44	65	4	98	31	427	107	55	43	63	106	18	28	43	64	41	39	58	49	38	8003 107
8004 108		4	3	25	25	44	40	34	3	1	2	5	20	19	4	8	2	4	2	4	19	2	8	9	4	6	1	5	4	7	2	16	5	15	19	5	17	59	4	51	22	5	3	25	34		32	3	117	33	22	25	67	47	5	11	23	29	24	13	31	27	23	8004 108
8005 119		7	2	5	7	12	13	10	7	1	2	9	16	13	13	15	4	8	2	2	7	2	10	2	1	2	7	6	9	8	10	8	2	7	6	4	4	19	7	10	5	4	4	15	20	1	33	12	171	36	18	14	17	32	5	7	12	17	9	13	14	11	8	8005 119
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8101 109		1		8	9	13	14	11	1				6	6	1	2		1		1	6		2	3	1	2		1	1	2	1	5	2	5	7	2	6	23	1	18	8	1	1	8	12		9	1	35	11	6	8	17	11	1	4	9	13	11	4	11	11	11	8101 109
8102 110		13	4	30	31	51	54	47	14	3	6	20	35	32	19	23	7	12	4	6	27	4	22	10	5	9	9	12	18	14	13	28	8	22	24	9	20	76	12	56	26	10	7	41	63	2	71	19	339	83	46	42	68	87	14	26	43	71	49	34	58	63	63	8102 110
8103 111		6	2	12	12	18	23	19	6	2	3	10	16	14	8	11	2	6	2	2	12	2	11	3	2	4	4	5	9	7	6	12	3	10	11	4	9	33	6	24	11	5	3	19	30	1	37	10	166	43	24	20	29	35	6	12	21	31	23	16	25	22	20	8103 111
8104 112		5	1	13	15	23	31	23	5	1	2		18	15	8	9	2	5	2	3	14	2	10	6	3	3	3	5	8	7	5	14	4	11	17	6	13	51	6	38	15	4	2	23	31	1	28	9	137	36	20	21	35	31	5	9	24	32	26	14	29	28	24	8104 112
8105 113		6	2	2	10	18	21	16	7	2	3	10	15	13	10	13	3	7	2	2	10	2	11	4	2	3	5	5	10	7	7	12	3	9	10	5	7	31	7	22	9	5	4	19	27	1	36	11	176	44	23	19	28	39	7	13	19	28	20	17	24	24	23	8105 113
8201 114				5	7	8	12	10	1				5	6	1	1		1		1	7		2	3	1	2		1	1	2		5		5	7	1	5	24		17	8	1		8	11		7		26	8	5	7	15	7	1	3	9	12	12	3	11	10	9	8201 114
8202 115																																																																		8202 115
SUB TOTAL	4	937	409	2673	2819	4885	4464	4269	1276	293	445	1353	3187	2793	1759	2073	593	1158	348	510	2239	286	1520	752	331	779	752	1016	1408	1335	1163	2303	649	1700	1763	664	1336	5448	887	3782	1700	693	527	3165	4633	148	4926	1226	21798	5368	3062	2691	4222	4350	876	1643	3139	4246	3001	2046	2630	3179	2516	SUB TOTAL
External Stations																																																																			
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2																																																																		2
3		1	1	2	2	5	6	5	2		3	2	2	1	1	3	1	1			1		2	1		1	1	2	3	1	1	3	1	1	1		1	2	1	2	1	1	1	3	4		5	1	24	7	4	3	2	4	1	2	2	3	2	2	2	2	2	3
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9		1	1	8	2	4	3	3	1		1	1	2	1	1	2	1	1			1		2	1				1	1	1	1	2	1	1	1		1	3	1	2	1	1*	1	3	4		8	1	32	8	5	3	4	6	1	2	2	3	2	3	3	2	2	9
10		7	5	31	17	29	21	24	8	2	4	7	14	12	10	17	4	9	3	2	10	3	13	5	2	5	3	10	8	6	6	11	4	10	8	3	7	19	6	16	8	7	5	21	30	1	52	5	212	54	34	24	30	41	8	16	16	22	14	17	20	14	13	10
11																																																																		11
12																																																																		12
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14		3	5	3	5	7	5	5	2		1	2	5	4	4	5	1	2	1	1	3	1	3	2		1	1	2	2	1	1	2	6	6	2	1	2	4	1	3	2	1	1	3	5		9	1	36	10	6	3	4	6	1	3	2	4	2	3	3	2	2	14
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SUB TOTAL	3	222	57	139	207	339	283	304	105	20	70	102	261	173	166	247	55	132	39	41	152	48	204	89	24	63	37	125	114	73	72	155	65	177	192	64	119	300	139	257	110	80	54	215	336	8	551	55	2261	614	386	252	295	422	93	187	177	267	170	189	222	168	160	SUB TOTAL
GRAND TOTAL	7	1159	466	2812	3026	5224	4747	4573	1381	313	515	1455	3452	2964	1925	2320	648	1290	387	551	2391	334	1724	841	355	842	789	1141	1522	1408	1235	2458	714	1877	1955	728	1455	5748	1026	4039	1810	773	581	3380	4969	156	5477	1281	24059	5982	3448	2943	4517	4772	969	1830	3316	4513	3171	2235	3852	3347	2676	GRAND TOTAL

Zone or Centroid of Origin

GREAT FALLS URBAN TRANSPORTATION STUDY
SUMMARY OF AUTO TRUCK & TAXI TRIPS
AVERAGE DAY 1981

Zone or Centroid of Destination

Zone or Centroid of Origin	7410 75	7411 76	7412 77	7413 78	7414 79	7501 80	7502 81	7503 82	7504 83	7505 84	7506 85	7507 86	7508 87	7509 88	7510 89	7511 90	7512 91	7513 92	7601 93	7602 94	7603 95	7701 96	7702 97	7703 98	7704 99	7801 100	7901 101	7902 102	7903 103	7904 104	8001 105	8002 106	8003 107	8004 108	8005 119	8006 120	8101 109	8102 110	8103 111	8104 112	8105 113	8201 114	8202 115	SUB TOTAL
7410 75	119	154	30	45	47	11	2	17	34	28	42	24	6	29	21	47	11	48	5	13	2	18	6	47	40	92	30	47	52	46	58	63	88	49	14	15	16	89	28	33	25	13		3540
7411 76	154	167	67	50	53	9	2	15	62	47	56	34	7	64	36	52	11	52	4	12	2	16	5	78	72	114	42	68	62	63	86	48	138	44	23	27	59	116	47	42	49	12		4343
7412 77	30	67	24	24	37	8	2	16	15	13	32	13	9	19	13	39	9	55	3	10	1	12	4	22	18	53	15	23	31	28	20	20	38	22	5	6	13	56	16	22	19	9		1731
7413 78	45	50	24	63	30	4		8	26	21	25	17	3	23	16	29	5	25	2	4	1	7	3	35	31	48	19	31	27	29	53	48	79	57	12	13	11	56	23	19	23	6		2281
7414 79	47	53	37	30	29	2		4	39	28	35	20	2	47	31	27	3	9	1	1	1	3	1	46	43	44	22	36	31	37	46	26	92	12	14	19	11	97	37	27	43	3		2099
7501 80	11	9	8	4	2	4		2	26	15	13	8		12	8	2		1	1	1		2	1	25	23	22	10	16	10	11	17	7	16	2	5	5	1	14	6	6	8		747
7502 81	2	2	2				1	6	4	3	2			2	1									6	4	2	2	3	2	2	3	1	4		1	1		3	1	1	2			131
7503 82	17	15	16	8	4	2	1	8	69	30	34	17	1	21	14	4		2	1	1	1	3	1	40	33	33	17	25	16	17	28	11	28	4	8	8	1	30	14	10	13	1		1314
7504 83	34	62	15	26	39	26	6	69	99	67	70	37	10	24	23	40	13	68	9	26	3	32	10	55	37	119	42	55	67	51	36	34	46	34	7	10	11	59	27	36	22	17		3411
7505 84	28	47	13	21	28	15	4	30	67	84	61	42	6	23	25	28	10	59	6	19	2	21	7	50	36	98	38	49	56	46	31	27	36	25	7	8	14	45	23	33	19	13		2631
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7507 86	24	34	13	17	20	8	2	17	37	42	62	63	4	35	28	19	7	42	3	11	1	15	6	57	36	91	57	43	67	38	28	21	33	17	7	9	8	49	25	29	16	10		2234
7508 87	6	7	9	3	2			1	10	6	8	4	1	12	6	2		1						9	8	8	4	6	4	5	8	3	14	1	3	4	14	17	6	4	6			348
7509 88	29	64	19	23	47	12	2	21	24	23	51	35	12	54	33	50	14	96	5	16	2	16	6	36	26	76	28	40	70	47	29	27	38	30	6	8	18	68	38	38	24	15		2515
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7513 92	48	52	55	25	9	1		2	68	59	63	42	1	96	84	8	2	12			1	3		103	91	91	60	74	109	129	82	30	105	7	25	28	3	128	36	82	63	3		3187
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7603 95	2	2	1	1	1			1	3	2	2	1		2	1	1		1						5	7	3	3	4	3	3	3	1	3	1				3	1	2	2			122
7701 96	18	16	12	7	3	2		3	32	21	18	15		16	10	3		3	1	1		9	1	40	46	24	22	29	17	19	24	12	31	3	9	8	1	21	14	12	12	1		1124
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8003 107	88	138	38	79	92	16	4	28	46	36	56	33	14	38	32	95	24	105	7	24	3	31	12	63	54	156	46	66	89	73	68	72	195	73	17	23	31	159	50	64	43	22		4691
8004 108	49	44	22	37	12	2		4	34	25	26	17	1	30	20	12	1	7	1	1	1	3	1	42	38	44	20	31	23	28	69	45	73	37	17	16	8	57	18	17	26	2		2104
8005 119	14	23	5	12	14	5	1	8	7	7	12	7	3	6	6	15	4	25	1	5		9	2	11	9	32	9	15	21	18	29	16	17	17	18	2	5	20	9	12	7	6		1223
8006 120	15	27	6	13	19	5	1	8	10	8	14	9	4	8	7	25	6	28	2	7		8	3	15	12	39	12	19	24	20	15	14	23	16	3	16	8	76	13	13	9	6		1098
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8102 110	89	116	56	56	97	14	3	30	59	45	89	49	17	68	51	99	22	128	6	16	3	21	8	75	67	123	51	74	94	90	74	63	159	57	20	28	41	196	76	72	76	21		4733
8103 111	28	47	16	23	37	6	1	11	27	23	36	25	6	35	27	39	12	79	2	8	1	14	5	42	36	78	33	42	85	60	32	24	50	18	9	11	12	76	53	58	28	15		2232
8104 112	33	42	22	19	27	6	1	10	36	30	34	29	4	38	37	29	11	82	3	9	2	12	5	59	50	90	42	53	110	106	46	26	64	17	12	13	10	72	58	72	29	15		2466
8105 113	25	49	19	23	43	8	2	13	22	19	26	16	6	24	19	46	12	63	3	10	2	12	4	31	27	66	20	34	41	37	31	24	43	26	7	9	15	76	28	29	49	11		2026
8201 114	13	12	9	6	3			1	17	13	13	10		15	10	3		3				1		29	28	28	18	28	17	36	21	8	22	2	6	6	1	21	15	15	11	3		759
8202 115																																												
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External Stations

Zone or Centroid of Origin	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	SUB TOTAL	GRAND TOTAL	Zone or Centroid of Origin
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7411 76			2	16	1	46	9	22	3	20			51	3	53	226	4369	7411 76
7412 77			1	8		24	5	9	1	9			25	1	23	106	1837	7412 77
7413 78			2	13	1	39	7	27	3	19			51	3	48	213	2494	7413 78
7414 79			1	10		36	9	14	2	12			33	2	33	152	2251	7414 79
7501 80			1	5		10	1	3	1	4			10	1	11	47	794	7501 80
7502 81						1							1		1	3	134	7502 81
7503 82			1	6		14	2	5	1	6			15	1	17	68	1382	7503 82
7504 83			2	15	1	39	6	14	2	15			39	2	41	176	3587	7504 83
7505 84			2	12	1	33	5	11	2	12			32	1	33	144	2775	7505 84
7506 85			2	15	1	43	7	16	2	16			44	2	47	195	3605	7506 85
7507 86			1	11		37	5	11	1	12			33	1	32	144	2373	7507 86
7508 87				1		5	1	2		2			5		5	21	369	7508 87
7509 88			1	10		34	5	12	2	12			32	1	29	138	2653	7509 88
7510 89			1	7		29	4	9	1	9			24	1	16	101	2018	7510 89
7511 90			1	9		34	8	13	1	12			31	1	30	140	2261	7511 90
7512 91				1		5		1		1			4		4	16	547	7512 91
7513 92			1	7		37	5	9	1	8			21	1	20	110	3297	7513 92
7601 93				1		2		1		1			2		2	9	293	7601 93
7602 94				2		5	1	2		2			3		1	16	797	7602 94
7603 95				1		2							2			5	127	7603 95
7701 96			1	6		16	2	4	1	5			12	1	14	62	1186	7701 96
7702 97				2		6	1	1		1			4		1	16	399	7702 97
7703 98			2	20	1	72	7	19	2	20			54	1	41	239	4746	7703 98
7704 99			2	16	1	60	6	15	2	15			41		3	161	3778	7704 99
7801 100			3	25		112	11	28	4	28			75			286	6510	7801 100
7901 101			1	8		37	4	9	1	9			25		18	112	2834	7901 101
7902 102			2	16		73	7	16	2	17			47		4	184	4136	7902 102
7903 103			1	9		43	5	11	1	11			31	1	7	120	4171	7903 103
7904 104			1	11		67	6	14	2	14			38	1	9	163	3797	7904 104
8001 105			2	16	1	39	6	18	5	41			68	3	59	258	4848	8001 105
8002 106			1	11	1	28	5	16	2	16			43	2	39	164	3013	8002 106
8003 107			2	16	1	47	9	23	3	20			54	3	54	232	4923	8003 107
8004 108			1	11	1	32	5	23	2	16			43	2	40	176	2280	8004 108
8005 119			1	6		13	2	6	6	42			21	1	22	120	1343	8005 119
8006 120			1	5		15	2	6	1	6			18	1	12	67	1165	8006 120
8101 109				3		12	2	5	1	4			12	1	11	51	840	8101 109
8102 110			2	18	1	66	16	26	3	23			61	3	61	280	5013	8102 110
8103 111			1	8		39	5	11	1	11			29	1	26	132	2364	8103 111
8104 112			1	6		34	3	8	1	7			20	1	14	95	2561	8104 112
8105 113			1	8		28	16	11	1	11			29	1	24	130	2156	8105 113
8201 114				3		20	1	3		3			9		2	41	800	8201 114
8202 115																		8202 115
SUB TOTAL			188	1482	106	2982	472	1296	212	1536			4747	258	4767	18046	266646	SUB TOTAL

External Stations

Zone or Centroid of Origin	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	SUB TOTAL
1																
2																
3	2	2	1	2	1	1		1	2	2	2	1		1	1	1
4	16	16	8	13	10	5		6	15	12	15	11	1	10	7	9
5	1	1		1				1	1	1						
6	40	46	24	39	36	10	1	14	39	33	43	37	5	34	29	34
7	7	9	5	7	9	1		2	6	5	7	5	1	5	4	8
8	21	22	9	27	14	3		5	14	11	16	11	2	12	9	13
9	3	3	1	3	2	1		1	2	2	2	1		2	1	1
10	20	20	9	19	12	4		6	15	12	16	12	2	12	9	12
11																
12																
13	53	51	25	51	33	10	1	15	39	32	44	33	5	32	24	31
14	3	3	1	3	2	1		1	2	1	2	1		1	1	1
15	51	53	23	48	32	11	1	17	41	33	47	32	5	29	16	30
SUB TOTAL	217	226	106	213	152	47	3	68	176	144	195	144	21	138	101	140
GRAND TOTAL	3757	4369	1837	2494	2251	794	134	1382	3587	2775	3805	2378	369	2653	2018	2261

Zone or Centroid of Origin	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59
1																																												
2																																												
3																																												
4																																												
5																																												
6	2	16	6	72	60	112	37	73	43	67	39	28	47	32	13	15	12	66	39	34	28	20																						
7	2	1	7	6	11	4	7	5	6	6	5	9	5	2	2	12	16	8	1	16	1																							
8	4	1	19	15	28	9	16	11	14	18	16	23	23	6	6	5	26	11	2	11	3																							
9	1		2	2	4	1	2	1	2	5	2	3	2	6	1	1	8	1	1	1																									
10	5	1	20	15	28	9	17	11	14	41	16	20	16	42	6	8	23	11	1	11	3																							
11																																												
12																																												
13	2	12	4	54	41	75	25	47	31	38	68	43	54	43	21	18	12	61	29	20	29	9																						
14		1		1					1	1	3	2	3	2	1	1	1	1	1	1	1																							
15		14	1	41	3		18	4	7	9	59	39	54	40	22	12	11	61	26	14	24	2																						
SUB TOTAL	5	46	261	14	310	79	216	49	278				723	68	628	2672	20718	SUB TOTAL
GRAND TOTAL		234	1743	120	3292	551	1512	261	1814				5470	326	5395	20718	287364	GRAND TOTAL

GREAT FALLS URBAN TRANSPORTATION STUDY
TRUCK DRIVER TRIPS
AVERAGE DAY 1981

Zone or Centroid of Destination

ZONE NO	6101 16	6102 17	6103 121	6201 18	6202 19	6301 20	6302 21	6303 22	6304 23	6305 24	6401 25	6501 26	6601 27	6602 28	6603 29	6604 30	6605 31	6606 32	6607 33	6608 34	6609 35	6610 36	6611 37	6612 38	6613 39	6701 40	6702 41	6703 42	6704 43	6705 44	6706 45	6801 46	6901 47	6902 48	7001 49	7101 50	7102 116	7201 51	7202 52	7203 117	7204 118	7301 53	7302 54	7303 55	7304 56	7305 57	7306 58	7307 59	7308 60	7309 61	7310 62	7311 63	7312 64	7313 65	7401 66	7402 67	7403 68	7404 69	7405 70	7406 71	7407 72	7408 73	7409 74	ZONE NO
6101 16		

GREAT FALLS URBAN TRANSPORTATION STUDY
TRUCK DRIVER TRIPS
AVERAGE DAY 1981

Zone or Centroid of Destination

ZONE NO	7410 75	7411 76	7412 77	7413 78	7414 79	7501 80	7502 81	7503 82	7504 83	7505 84	7506 85	7507 86	7508 87	7509 88	7510 89	7511 90	7613 91	7514 92	7601 93	7602 94	7603 95	7701 96	7702 97	7703 98	7704 99	7801 100	7901 101	7902 102	7903 103	7904 104	8001 105	8002 106	8003 107	8004 108	8005 119	8006 120	8101 109	8102 110	8103 111	8104 112	8105 113	8201 114	8202 115	SUB TOTAL
6101 16																																												
6102 17	4	1	1	1	1			1	2	1	2	1		1	1									3	1		1		2		2	1	1		1			1	1		1				264
6103 121																																												
6201 18	3	2	1	1	1				2	3	4	2		1	1									2	2		1	2			1	1	1	1	1	1		1		1					282
6202 19	5	3	2	3	1	1			7	3	3	3		2	1	1		1				1		1	5		1		3	3	4	1	2	1	1			2	1		2				531
6301 20	12	4	2	11	2	1		1	6	5	7	6		5	1	1		2				3		7	2	3	1		5		4	2	4	2	4	1		5	6	3	1				1018
6302 21	7	3	2	6	1	1		1	7	5	6	4		3	5	1		1				1		5	9	2	4	3	2	1	1	2	5	1	1			3	1	2	4				676
6303 22	6	7	3	11	2	1		1	10	11	13	6		5	4	1		1				1		7	7		3	7	1	5	1	5	4	2	4	2		5	2	1	3	1			1064
6304 23	1	1		1	1				1	1	1	1		1	1									1	2	1	1	1	1		1		1					1	1						139
6305 24																																												3
6401 25	1	1	1	1					2	1	1	1		1	1									1	1	1		1	1	1	1		1					1	1	1					112
6501 26	2	2	3	2	1			1	4	4	2	3		2	1			1				1		3	3	6	1	1	1	2	1	5	1	1	1			2	1		1				316
6601 27	3	3	2	3	2	1			5	2	5	2		2	2	1		1				1		1		1			1	1	1	1	2	1	1	1		3	3	1	1				382
6602 28	2	1	2	2	1				3	1	2	1		1	1									2	2		1	2			1	1			1			1	1	1	1				249
6603 29	2	1	1	2	1				2	1	1	2		1	1			1						2	2		1	1	1	1	2	1	1		1			1	1	1	1				272
6604 30	4	2	2	3	1			1	3	2	3	2		2	3	1		1						5	2	1	2	2	1	1	3	2	2	1	1	1		3	3	2	1				421
6605 31	1			1					1	1		1		1										1			1				1		1					1	1						94
6606 32	1	1		1					1	1	1	1			1									1			1				1		1					1	1						119
6607 33	1	1		1					1	1	1	1		1										1			1				1	1	1					1	1		1				124
6608 34	1			1					1																1						1														60
6609 35	2	1	1	3	1				2	2	1	3		2	2							1		2		3	1		1	1	2	1	2	1	1	1		2	1	1	1				260
6810 36	1	1		1					1	1															1		2		1	1	1		1					1			1				92
6611 37	6	3	3	7	2	1			7	3	7	4		2	2	1		1				1		1	5	8	2	1	5	5	5	3	3	1	2	1		4	2	1	3				577
6612 38	2	1	1	2	1				1	1	2	1		1	1									1	2	3	1		2	2	2	1	1		1			1	1		1				200
6613 39																																												14
6701 40	1		1	1					1	1	1	1		1	1									2	1	2			1	1	1	1	1		1			1	1						152
6702 41									1					1											1																				47
6703 42	3	2	1	3	1			1	3	2	3	4		3	1							1		5	2	5	1	1	1		3	1	1	1	1	1		1	3	1	1				350
6704 43	1	1	1	1					2	1	1	1		1										1	1	1	1	1		1	1		1					1		1					109
6705 44	1	1		1					1	1	1	1		1										2	1	2					1								1							111
6706 45																																												25
6801 46	3	1	1	2	1				3	2	3	4		3	1	1						1		5	2	1	1	2	1	1	3	1	2		1			3	1	1	1				283
6901 47	1			1								1		1	1																1	1						1							88
6902 48	2	3	2	4	1				3	1	2	1		2	2	1		1						4	1		2		1	1	3	1	1	1	1	1		4	2	1	1				371
7001 49	2	1	1	2	1				1	1	1	1		1	1									1	1	1	1	1	1	1	1	1	1		1			2	1	1	1				153
7101 50									1																																			24
7102 116	2	1	1	2	1				1		2	1		2	1									2	2		1		1	1	1	1	1		1			1	3		1				145
7201 51	5	3	2	5	2			1	6	2	2	5		3	3	1		1						3	3	1	1	2	2	2	4	2	3	1	1	1		3	3	1	2				407
7202 52				1																				1							1														28
7203 117	5	2	2	5	2				3	1	6	3		4	4	1		1						4	4		1	1	4	2	4	2	3	1	2	1		2	2	1	2				434
7204 118	3	1	1	3	1				2		3	1		2	2									2	2				1	1	2	1	1		1	1		1	1	1	1				192
7301 53	3	2	2	3	1			1	4	3	3	3		2	2	1		1				1		4	3	4	1	2	2	1	2	1	2	1	1	1		2	2	1	1				299
7302 54	1	1	1	1					1	1	1	1		1										1	1		1				1														78
7303 55	4	3	3	4	2	1		1	5	4	5	5		4	3	1		1				1		5	4	6	2	2	3	2	3	3	3	1	1	1		4	1	1	2				435
7304 56	13	6	5	12	4	1		2	12	8	11	8	1	7	6	2		2				2		11	8	13	4	7	6	5	6	8	5	2	3	2	1	7	2	3	5	1			1011
7305 57																																												
7306 58	25	12	9	30	8	2		3	19	13	18	16	1	14	12	4		5				3		16	9	11	7	11	11	11	24	10	13	5	6	5	1	13	14	6	10	1			1963
7307 59	1			1																						1																			36
7308 60	45	24	20	38	14	2	1	5	38	17	41	34	2	25	14	7	1	5		1	1	7		51	24	13	14	18	30	15	27	15	22	9	11	12	3	27	27	17	10	2			2847
7309 61	20	12	9	19	7	1		2	17	10	18	16	1	12	10	3		4		1		4		22	10	17	4	8	6	13	13	8	11	4	3	2	3	13	13	3	7	2			1196
7310 62	16	10	7	16	5	1		2	14	10	17	13	1	9	8	3		3				2		8	8	13	5	10	5	10	8	5	8	3	4	2	1	10	2	3	5	1			947
7311 63	13	6	5	10	4	1		1	10	6	10	9		7	5	2		2				1		8	10	8	4	8	5	5	7	1	6	2	3	2	1	8	5	3	5	1			715
7312 64	28	9	6	19	4	1		1	8	5	8	7		5	5	2		2				1		7	6	9	3	5	5	5	12	1	7	4	2	2	1	8	5	3	5	1			756
7313 65	23	9	6	29	6	1		1	9	7	8	8	1	7	6	4		3				1		8	8	12	4	6	5	6	17	12	10	7	3	2	1	13	1	3	6	1			871
7401 66	5	3	2	4	2	1		2	7	4	5	5		3	3	1		1				1		5	5	6	2	3	3	2	3	2	3	1	1	1		4	4	2	2				447
7402 67	9	7	6	7	4	2	1	4	24	10	15	9	1	6	5	2		2				3		10	9	12	4	6	5	6	4	3	5	2	2	2	1	7	1	3	4	1			791
7403 68	6	4	3	5	2			1	7	3	6	4		3	3	1		1				1		5	4	6	2	3	3	2	3	2	3	1	1	1		3	3	2	2				470
7404 69	11	6	6	7	4	1	1	3	24	9	14	10	1	6	6	2		2				2		10	8	13	4	6	5	5	5	3	5	2	2	2	1	8	2	3	4	1			831
7405 70	5	4	4	5	3	1		3	20	8	14	7	1	5	4	1		1				1		7	5	9	3	4	3	3	3	2	3	1	1	1		5	4	2	3				506
7406 71	6	4	3	6	2	1		1	6	5	7	6		4	4	1		1				1		6	4	4	3	3	3	3	4	2	3	1	1	1		4	4	2	3				408
7407 72	10	6	5	7	3	1		1	8	5	10	7	1	6	4	2		2				1		6	6	8	2	5	3	4	3	3	3	2	1	1	1	6	4	2	3				561
7408 73	11	7	6	5	3			1	8	5	12	7	1	6	4	2		2				1		4	5	7	2	3	3	2	3	2	4	1	1	1	1	6	1	2	3				429
7409 74	9	6	8	7	6	1		2	16	7	20	14	1	11	6	3		2				1		7	5	9	3	4	5	4	3	3	4	2	1	1	1	11	1	3	5				931

Zone or Centroid of Origin

External Stations

ZONE NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	SUB TOTAL	GRAND TOTAL
6101 16																	
6102 17			1	3	3	1		1		1			10	1	68	109	373
6103 121																	
6201 18			1	3				1		1			8	1	8	23	305
6202 19				4			1	2		3			15	1	20	47	578
6301 20				9			2	1	2	9			27	2	31	86	1104
6302 21				16		9	1	2		2			18	1	21	74	750
6303 22				12	1	18	1	3	2	8			27	2	31	108	1172
6304 23				3		1				1			4		4	14	153
6305 24																	3
6401 25				9		1							3		4	20	132
6501 26			1	5		7	1	1	2	2			5	1	6	31	347
6601 27			1	3		7	1	1		2			15	2	47	79	461
6602 28			1	2		4		2		2			8	1	15	33	284
6603 29				2		1		1		1			9	1	21	37	309
6604 30			1	4		1	1	1		3			18	1	15	45	466
6605 31				1						1			3		4	9	103
6606 32				1		1				1			5		6	14	133
6607 33				1						1			5		5	12	136
6608 34				1		1							2		6	10	70
6609 35				2		3		1		1			12	1	11	31	291
6810 36				1		1		1		1			8		4	16	108
6611 37			1	5		7	1	3		3			43	1	20	84	661
6612 38				1		2		1		1			22	1	9	37	237
6613 39													3		1	4	18
6701 40			1	2		2		1		1			4		4	15	167
6702 41				1									1		1	3	50
6703 42				5		6	1	2	10	2			10	1	12	50	400
6704 43			1	4		1							3		3	12	123
6705 44			1	2		2		1		1			3		3	13	124
6706 45													1		1	2	27
6801 46			2	8	2	1		1		1			7	1	8	31	314
6901 47				1		1		1		1			5	3	6	18	106
6902 48			1	3		7	1	3		2			21	4	24	66	437
7001 49				1		4		1		1			39		5	51	204
7101 50						1							10		1	12	36
7102 116				1		2		1		1			19		5	29	174
7201 51			1	3		11	1	2		3			44	1	13	79	486
7202 52						1							9		1	11	39
7203 117			1	3		6	1	2		3			47	1	14	78	492
7204 118				1		3		1		2			13	1	7	28	220
7301 53				3		5	1	2		2			5		6	25	318
7302 54				1		1				1			2		2	7	85
7303 55			1	3		5	1	2		3			9	1	9	34	469
7304 56			2	7		15	2	5		6			17	1	17	72	1083
7305 57																	
7306 58				12	3	30	4	10	1	12			39	3	38	155	2118
7307 59						1							1		1	3	39
7308 60			1	13	5	46	5	18	10	23			69	6	104	302	3149
7309 61			2	9	3	20	3	9	2	6			26	2	24	106	1302
7310 62			2	7	2	15	2	7	2	5			15	1	18	76	1023
7311 63				5		11	2	5	1	6			20	2	10	63	778
7312 64				4		16	2	6	1	6			18	1	13	68	824
7313 65			1	5		18	2	9	1	7			20	1	15	79	950
7401 66				3		8	1	2		3			7		5	30	477
7402 67			1	5		16	2	5		4			8	1	19	61	852
7403 68			1	3		8	1	2		2			7		5	29	499
7404 69				5		15	2	4		4			12	1	18	62	893
7405 70				3		11	1	2		2			4		6	30	536
7406 71			1	3		9	1	3		3			9		13	42	450
7407 72			1	3		11	1	3		3			9		8	39	600
7408 73				2		9	1	2		2			7	1	7	32	461
7409 74				2		11	2	3		2			8		10	39	570

GREAT FALLS URBAN TRANSPORTATION STUDY
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Zone or Centroid of Destination

ZONE NO.	6101 16	6102 17	6103 121	6201 18	6202 19	6301 20	6302 21	6303 22	6304 23	6305 24	6401 25	6501 26	6601 27	6602 28	6603 29	6604 30	6605 31	6606 32	607 33	66 34	6609 35	6610 36	6611 37	6612 38	6613 39	6701 40	6702 41	6703 42	6704 43	6705 44	6706 45	6801 46	6901 47	6902 48	7001 49	7101 50	7102 118	7201 51	7202 52	7203 117	7204 118	7301 53	7302 54	7303 55	7304 56	7305 57	7306 58	7307 59	7308 60	7309 61	7310 62	7311 63	7312 64	7313 65	7401 66	7402 67	7403 68	7404 69	7405 70	7406 71	7407 72	7408 73	7409 74	ZONE NO.
7410 75		4		1	5	12	7	6	1		1	2	1	2	2	4	1	1	1	1	2	1	6	2		1		1	1	1		3	1	2	2		2	5		5	3	3	1	4	13		25	1	45	20	16	13	28	23	5	9	6	11	5	6	10	11	9	7410 75
7411 76		1		2	3	4	3	7	1		1	2	1	1	1	2		1	1		1	1	3	1				2	1	1		1		3	1		1	3		2	1	2	1	3	6		12		24	12	10	6	9	9	3	7	4	6	4	4	6	7	6	7411 76
7412 77		1		1	2	3	2	3			1	2	2	2	1	2					1		3	1		1		1	1			1		2	1		1	2		2	1	2	1	3	5		9		20	9	7	5	6	6	2	6	3	6	4	3	5	6	8	7412 77
7413 78		1		1	3	11	6	11	1		1	2	2	2	2	3	1	1	1	1	3	1	7	2		1		1	1	1		2	1	4	2		2	5	1	5	3	3	1	4	12		30	1	38	19	14	10	19	29	4	7	5	7	5	6	7	5	7	7413 78
7414 79		1		1	1	2	1	2	1			1	2	1	1	1					1		2	1				1				1		1	1		1	2		2	1	1		2	4		8		14	7	5	4	4	6	2	4	2	4	3	2	3	3	6	7414 79
7501 80					1	1	1	1					1										1																					1	1		2		2	1	1	1	1	1	1	2		1	1	1	1	1		1	7501 80
7502 81																			1																														1						1		1						7502 81
7503 82		1				1	1	1				1				1												3										1				1		1	2		3		5	2	2	1	1	1	2	4	1	3	3	1	1	1	2	7503 82
7504 83		2		2	7	6	7	10	1		2	4	5	3	2	3	1	1	1	1	2	1	7	1		1	1	3	2	1		3		3	1	1	1	6		3	2	4	1	5	12		19		38	17	14	10	8	9	7	24	7	24	20	6	8	8	16	7504 83
7505 84		1		3	3	5	5	11	1		1	4	1	1	1	2	1	1	1		2	1	3	1		1		2	1	1		2		1	1			2		1		3	1	4	8		13		37	10	10	6	5	7	4	10	3	9	8	5	5	5	7	7505 84
7506 85		2		4	3	7	6	13	1		1	2	1	2	1	3		1	1		1	1	7	2		1		1	1	1		3		2	1		2	2		6	3	3	1	5	11		18		41	18	17	10	8	8	5	15	6	14	14	7	10	12	20	7506 85
7507 86		1		2	3	6	4	6	1		1	1	2	1	2	2	1	1	1		3		4	1		2		4	1	1		4	1	3	1		1	5		3	1	3	1	5	8		16		34	16	13	9	7	8	5	9	4	10	7	6	7	7	14	7507 86
7508 87																																												1		1		2	1	1				1		1	1		1	1	1	7508 87
7509 88		1		1	2	5	3	5	1		1	2	2	1	1	2	1		1		2		2	1		1	1	1	1	1		3	1	2	1		2	3		4	2	2	1	4	7		14		25	12	9	7	5	7	3	6	3	6	5	4	6	6	11	7509 88
7510 89		1			1	1	5	4	3		1	1	2	1	1	3			1		2		2	1		1		1				1	1	2	1		1	3		4	2	2		3	6		12		14	10	8	5	5	6	3	5	3	6	4	4	4	4	6	7510 89
7511 90					1	1	1	1					1			1							1									1		1				1		1		1		1	2		4		7	3	3	2	2	4	1	2	1	2	1	1	2	2	3	7511 90
7512 91																																																	1														7512 91
7513 92					1	2	1	1				1	1		1	1							1											1				1		1		1		1	2		5		5	4	3	2	2	3	1	2	1	2	1	1	2	2	2	7513 92
7801 93																										1																																						7601 93
7602 94																																																	1	1														7602 94
7603 95																																																	1														7603 95
7701 96					1	3	1	1				1	1								1		1					1				1										1		1	2		3		7	4	2	1	1	1	1	3	1	2	1	1	1	1	1	7701 96
7702 97																																																																7702 97
7703 98		3		2	1	7	5	7	1		1	3	1	2	2	5	1	1	1		2		1	1		2		5	1	2		5		4	1		2	3	1	4	2	4	1	5	11		16		51	22	8	8	7	8	5	10	5	10	7	6	6	4	7	7703 98
7704 99		1		2	5	2	9	7	2		1	3		2	2	2				1		1	5	2		1	1	2	1	1		2		1	1		2	3		4	2	3	1	4	8		9		24	10	8	10	6	8	5	9	4	8	5	4	6	5	5	7704 99
7801 100						3	2		1		1	6	1			1	1	1	1		3	2	8	3		3		5	1	2		1			1			1				4	1	6	13		31	1	13	17	13	8	9	12	6	12	6	13	9	4	8	7	9	7801 100
7901 101		1		1	1	1	4	3	1	1		1		1	1	2					1		2	1				1	1			1		2	1		1	1		1		1		2	4		7		14	4	5	4	3	4	2	4	2	4	3	3	2	2	3	7901 101
7902 102				2			3	7	1		1	1	1	2	1	2							1					1	1			2			1			2		1		2		2	7		11		18	8	10	8	5	6	3	6	3	6	4	3	5	3	4	7902 102
7903 103		2			3	5	3	1	3		1	1	1		1	1					1	1	5	2		2		1				1		1	1		1	2		4	1	2		3	6		11		30	6	5	5	5	5	3	5	3	5	3	3	3	3	5	7903 103
7904 104					3		1	5			1	2	1		1	1					1	1	5	2		2			1			1		1	1		1	2		2	1	1		2	5		11		15	13	10	5	5	6	2	6	2	5	3	3	4	2	4	7904 104
8001 105		2		1	4	4	4	4	1		1	2	3	2	2	3	1	1	1	1	2	1	5	2		1		3	1	1		3	1	3	1		1	4	1	4	2	2	1	3	6		24		27	12	8	7	15	17	3	4	3	5	3	4	3	3	3	8001 105
8002 106		1		1	1	2	2	5				2	1	1	1	2					1		3	1		2		1				1	1	1	1		1	2		2	1	1		2	4		10		19	8	6	4	8	12	2	3	2	3	2	2	3	2	2	8002 106
8003 107		1		1	2	4	5	4	1		1	1	1	1	1	2	1	1	1		2	1	3	1		2		1	1			2		1	1		1	3		3	1	2	1	3	5		13		22	11	8	6	7	10	3	5	3	5	3	3	5	4	4	8003 107
8004 108				1	1	2	1	2				1	1			1					1		1					1						1				1		1		1		1	2		5		9	4	3	2	4	7	1	2	1	2	1	1	2	1	2	8004 108
8005 119		1		1	1	4	1	4				1	1	1	1	1					1		2	1		2		1				1		1	1			1		2	1	1		1	3		6		11	3	4	3	2	3	1	2	1	2	1	1	1	1	1	8005 119
8006 120				1		1	1	2					1			1					1		1					1						1						1	1	1		1	2		5		12	2	2	2	2	2	1	2	1	2	1	1	1	1	1	8006 120
8101 109																																												1		1		3	1	1	1	1	1			1	1	1		1	1	8101 109
8102 110		1		1	2	3	3	5	1		1	1	1	1	1	3	1	1	1		2	1	4	1		1		1	1	1		3	1	4	2		1	3		3	1	2	1	4	7		13		27	12	10	8	8	12	4	7	3	8	5	4	6	6	11	8102 110
8103 111		1			1	6	3	2	1		1	1	2	1	1	3	1	1	1		1		2	1		2		2	1	1		1		2	1		1	3		2	1	2	1	3	7		14		27	11	5	6	5	7	4	6	3	6	4	4	4	3	5	8103 111
8104 112				1		3	2	1			1		1	1	1	2					1		1					1	1			1		1	1			1		1	1	1		1	3		6		17	3	3	3	3	3	2	3	2	3	2	2	2	2	3	8104 112
8105 113		1			2	1	4	3				1	1	1	1	1			1		1	1	3	1			2	1				1		1	1		1	2		2	1	1		2	5		10		10	7	5	5	5	6	2	4	2	4	3	3	3	3	5	8105 113
8201 114								1																																					1		1		2	2	1	1	1	1		1		1						8201 114
8202 115																																																																8202 115
																										2																																								
SUB TOTAL		264		282	531	1018	676	1064	139	1	112	116	182	249	272	421	94	119	124	60	260	92	977	200	14	152	47	350	109	133	25	283	88	271	153	24	145	407	28	414	192	290	78	435	1011		1963	36	2847	1196	947	715	756	871	447	791	470	831	506	408	561	429	531	SUB TOTAL

External Stations

1																																																																				1
2																																																																				2
3		1		1	1	3	4	3	1		3	1	1	1	1	1							1			1		1	1	1		2		1				1		1		1		3	2		3		3	2	2	1	1	1	1	1	1	1	1	1	1	1	1	3
4		3		3	4	9	16	12	3		9	1	1	2	2	4	1	1	1	1	2	1	5	1		2	2	1	4	2		8	1	3	1		1	3		3	1	3	1	3	7		12		13	9	7	5	4	5	3	5	3	5	3	3	3	2	2	4
5		3						1																							2																	3		5	3	2													5
6		1					9	18	1		3	1	1	4	1	1		1		2	3	1	7	2		2		6	1	2		1	1	7	4	1	2	11	1	6	3	5	1	5	15		30	1	46	20	15	11	16	18	8	16	8	15	11	9	11	9	11	6
7					1	2	1	1				1	1			1							1					1						1				1		1		1		1	2		4		5	3	2	2	2	2	1	2	1	2	1	1	1	1	2	7
8		1		1	2	1	2	3				1	2	2	1	1					1	1	3	1		4		2		1		1	1	3	1		1	2		2	1	2		2	5		10		18	9	7	5	6	9	2	5	2	4	2	3	3	2	3	8
9						2		2				2																10																			1		10	2	2	1	1	1										9
10		1		1	3	9	2	8	1			2	2	2	1	3	1	1	2		1	1	3	1		1		2		1		1	1	2	1		1	3		3	2	2	1	3	6		12		23	6	5	6	6	7	3	4	2	4	2	3	3	2	2	10
11																																																																			11
12																																																																			12
13		10		2	15	27	18	27	4		9	1	15	8	9	18	3	5	5	2	12	8	43	22	3	4	1	10	3	3	1	7	5	21	39	10	19	44	9	47	13	5	2	9	17		39	1	69	26	15	20	18	20	7	8	7	12	4	9	9	7	8	13
14		1		1	1	2	1	2				1	2	1	1	1					1		1	1				1				1	3	4				1		1	1			1	1		3		6	2	1	2	1	1		1		1					1	14
15		88		2	20	31	21	31	3		4	6	47	15	21	15	4	6	5	2	11	4	20	9	1	4	1	12	3	3	1	8	6	24	5	1	5	13	1	14	7	6	2	9	17		38	1	104	24	18	10	13	15	5	19	5	18	6	13	8	7	10	15
SUB TOTAL		109		23	47	86	74	108	14		20	31	78	35	37	45	9	14	12	10	31	14	84	37	4	15	1	50	12	13	2	31	18	66	51	12	29	79	11	78	28	25	7	34	72		155	3	302	106	76	63	68	79	30	61	29	62	30	42	39	32	39	SUB TOTAL
GRAND TOTAL		373		305	578	1104	750	1172	153	1	132	147	461	284	309	466	103	133	136	70	291	108	661	237	18	167	50	400	121	124	27	314	106	437	204	36	174	486	39	492	220	318	85	469	1083		2118	39	3149	1302	1023	778	824	950	477	852	499	893	536	450	600	461	570	GRAND TOTAL

Zone or Centroid of Origin

GREAT FALLS URBAN TRANSPORTATION STUDY
TRUCK DRIVER TRIPS
AVERAGE DAY 1981

Zone or Centroid of Destination

Zone of Origin	7410 75	7411 76	7412 77	7413 78	7414 79	7501 80	7502 81	7503 82	7504 83	7505 84	7506 85	7507 86	7508 87	7509 88	7510 89	7511 90	7512 91	7513 92	7601 93	7602 94	7603 95	7701 96	7702 97	7703 98	7704 99	7801 100	7901 101	7902 102	7903 103	7904 104	8001 105	8002 106	8003 107	8004 108	8005 109	8006 120	8101 109	8102 110	8103 111	8104 112	8105 113	8201 114	8202 115	SUB TOTAL
7410 75	51	32	9	15	7	1		1	6	5	8	5	1	6	4	3		2				1		6	5	8	2	5	4	4	6	1	10	3	2	2	1	13	6	3	4			607
7411 76	32	20	8	9	6			1	4	3	5	4	1	5	3	2		2				1		4	4	5	2	3	3	3	3	2	1	2	1	1	1	8	5	2	4			362
7412 77	9	8	16	8	5			1	5	3	10	5	2	7	4	3		2				1		3	4	5	2	2	3	3	2	2	6	1	.	1	1	10	4	2	5			303
7413 78	15	9	8	44	9	1		1	5	4	6	5	1	6	5	4		3				1		6	6	8	2	5	4	4	7	1	13	10	.	2	1	12	8	3	5	1		561
7414 79	7	6	5	9	9				4	2	5	3	1	5	4	5		2						2	2	4	1	2	3	3	2	2	6	1	1	1	2	17	7	3	5			244
7501 80	1			1		1			1	1	1	1												1	1	1		1											1	1					38
7502 81																																													3
7503 82	1	1	1	1				1	4	1	3	1		1	1									1	1	1		1	1	1	1		1					8	1					71
7504 83	6	4	5	5	4	1		4	64	22	19	12	1	7	6	2		2				2		11	7	12	5	5	5	4	1	2	5	1	2	2	1	7	6	3	4	1		607
7505 84	2	3	2	4	2	1		1	22	40	15	14		5	6	1		2				1		9	5	9	4	4	4	3	1	2	3	1	1	1		4	4	2	2			388
7506 85	8	5	10	6	5	1		3	19	15	57	23	1	13	12	2		3				1		10	6	10	5	6	8	5	2	2	2	1	1	1	3	14	9	3	5	1		612
7507 86	5	4	5	5	3	1		1	12	14	23	49	1	13	12	1		2				1		13	8	12	11	7	12	6	2	2	1	1	1	1	1	8	8	4	3	1		517
7508 87	1	1	2	1	1				1		1	1		1	1																		5					7	1					28
7509 88	6	5	7	6	5			1	7	5	13	13	1	31	12	2		3				1		6	5	8	3	3	6	4	3	2	4	1	1	.	1	14	10	3	4	1		396
7510 89	4	3	4	3	4			1	6	6	12	12	1	12	25	2		4				1		6	4	7	3	4	11	5	1	1	4	4	1	1	1	1	9	4	4	1		337
7511 90	3	2	3	4	5				2	1	2	1		2	2	2		1						1	1	2	1	1	1	1	1	2	2	1				1	3	1	2			113
7512 91																																							3	1					3
7513 92	2	2	2	3	2				2	2	3	2		3	4	1		4						2	2	3	1	1	4	4	1	1	2	1				5	11	5	2			132
7601 93																																													
7602 94																																													2
7603 95																									1	1																			3
7701 96	1	1	1	1					2	1	1	1		1	1							3		2	3	3	1	2	1	1			1					3	1		1			78
7702 97																									1																				1
7703 98	6	4	3	6	2	1		1	11	9	10	13		6	6	1		2				2		73	11	14	13	11	9	5	3	2	4	1	1	.	1	3	6	4	3	1		531
7704 99	5	4	4	6	2	1		1	7	5	6	8		5	4	1		2			1	3	1	11	64	16	5	10	7	6	2	2	1	1				5	6	2	3	1		423
7801 100	8	5	5	8	4	1		1	12	9	10	12		8	7	2		3			1	3		14	16	160	7	24	8	8	3	3	6	2	1	2	1	8	8	5	5	1		630
7901 101	2	2	2	2	1				5	4	5	11		3	3	1		1				1		13	5	7	12	6	5	3	3	2	2	1	.	1		3	4	2	1			215
7902 102	3	3	2	5	2	1		1	5	4	6	7		3	4	1		1				2		11	10	24	6	37	6	6	3	2	1	1	.	1		8	5	2	3	1		319
7903 103	4	3	3	4	3			1	5	4	8	12		6	11	1		4				1		9	7	8	5	6	25	8	3	2	1	2	1	8	8	8	13	6	3	1		333
7904 104	4	3	3	4	3			1	4	3	5	6		4	5	1		4				1		5	6	8	3	6	8	26		1	3	1	.	1	1	6	9	6	3	1		288
8001 105	6	3	2	7	2			1	4	3	4	4		3	3	1		1						3	2	3	2	2	3	3	26	1	1	1	3	1		3	3	2	2			335
8002 106	6	2	2	8	2				2	2	2	2		2	1	1		1						2	2	3	1	1	2	1	1	3	8	2	1			3	2	1	1			197
8003 107	10	6	6	13	6			1	5	3	5	4	1	4	4	2		2				1		4	4	6	2	3	4	3	3	3	22	2	1	8	8	11	5	3	4			330
8004 108	3	2	1	10	1				1	1	1	1		1	1	1		1						1	1	2	1	1	1	1	1	2	2	2				3	1	1	1			113
8005 119	2	1	1	1	1				2	1	1	1		1	1									1	1	1	1	1	1	1	3	2	1		7			3	1	1	1			115
8006 120	2	1	1	2	1				2	1	1	1		1	1	1								1	1	2	1	1	1	1	1	1	1			4		2	1	1	1			91
8101 109	1	1	1	1	2				1		1	1		1	1									1		1			1	1			1					3	1		1			36
8102 110	13	8	10	12	17	1		1	7	4	14	8	2	10	9	8	1	5				1		5	5	8	3	4	6	6	3	3	11	1	.	2	3	32	14	5	10	1		476
8103 111	6	5	4	8	7	1		1	6	4	9	8	1	10	9	3	1	11				1		6	6	8	4	5	13	9	1	2	1	1	.	1	1	8	33	16	7	1		404
8104 112	3	2	2	3	3				3	2	3	4		3	4	1		5						4	2	5	2	2	6	6	2	1	1	1	1			2	16	8	2	1		193
8105 113	4	4	5	5	5				4	2	5	3		4	4	2		2				1		3	3	5	1	3	3	3	2	1	4	1	1	1	1	10	7	2	15			234
8201 114				1					1		1	1		1	1									1	1	1		1	1	1									1	1					28
8202 115																																													
SUB TOTAL	607	362	303	561	244	38	3	71	607	388	612	517	28	396	337	113	3	132		2	3	78	1	531	423	630	215	319	333	288	335	197	330	11	115	91	36	476	404	193	234	28		36987

External Stations

Zone of Origin	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	SUB TOTAL	GRAND TOTAL	ZONE NO
7410 75			1	3		13	2	5		4			13	1	14	56	663	7410 75
7411 76				2		8	1	3		2			8		4	28	390	7411 76
7412 77				1		8	2	2		2			6		4	25	328	7412 77
7413 78			1	2		11	2	9		4			11		6	46	607	7413 78
7414 79				1		7	2	2		1			5		3	21	265	7414 79
7501 80						1							1		1	3	41	7501 80
7502 81																	3	7502 81
7503 82				1		2							1		1	5	76	7503 82
7504 83			1	4		13	2	3		2			6	1	8	40	647	7504 83
7505 84			1	3		10	1	2		3			10	1	2	33	421	7505 84
7506 85			1	3		13	2	3		3			9		7	41	653	7506 85
7507 86			1	3		15	1	3		2			6		3	34	551	7507 86
7508 87						1							1			2	30	7508 87
7509 88			1	2		11	1	2		2			7		2	28	424	7509 88
7510 89				1		12	2	2		2			6		6	31	368	7510 89
7511 90						4	1	1		1			2		1	10	123	7511 90
7512 91																	3	7512 91
7513 92						9	1	1		1			2			14	146	7513 92
7601 93																		7601 93
7602 94						1										1	3	7602 94
7603 95						1										1	4	7603 95
7701 96				1		3		1					1		1	7	85	7701 96
7702 97																	1	7702 97
7703 98			1	3		21	2	3		2			7		11	50	581	7703 98
7704 99			1	2		19	1	3		2			7		2	37	460	7704 99
7801 100			1	3		31	2	4		4			11			56	686	7801 100
7901 101				1		11	1	1		2			6		4	26	241	7901 101
7902 102			1	3		19	1	2		2			5		2	35	354	7902 102
7903 103			1	2		16	1	2		2			6			30	363	7903 103
7904 104				1		25	1	2		2			6			37	325	7904 104
8001 105			1	2		7	1	2	1	8			10	1	7	40	375	8001 105
8002 106				1		5	1	2		1			4		5	19	216	8002 106
8003 107				2		8	2	3		2			8		5	30	360	8003 107
8004 108				1		3		2		1			2		1	10	123	8004 108
8005 119				1		4		1	1	13			4		2	26	141	8005 119
8006 120				1		3		1		1			2		2	10	101	8006 120
8101 109						1							1			2	38	8101 109
8102 110			1	2		14	4	4		3			10		5	43	519	8102 110
8103 111			1	3		18	2	2		2			7		2	37	441	8103 111
8104 112				1		14	1	1		1			4		3	25	218	8104 112
8105 113				1		7	6	2		2			5		3	24	258	8105 113
8201 114						4							1			5	33	8201 114
8202 115																		8202 115
SUB TOTAL			73	278	19	767	95	213	36	243			1019	54	948	3745	40732	SUB TOTAL

External Stations

Zone of Origin	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	SUB TOTAL	GRAND TOTAL	ZONE NO
1																		1
2																		2
3	1			1		1						2	1		2	5	78	3
4	3	2	1	2	1			2		1		1			8	24	302	4
5															1	1	20	5
6	13	8	8	11	7	1	2	13	10	13	15	1	11	12	4	9	1	1	3	21	19	31	11	19	16	25	2	5	1	2	1	3	3	6	18	14	7	4	767	6
7	2	1	2	2	2			2	1	2	1		1	2	1	1		2	1	1	1	1	1	1	1	1	1	2				6	2	1	6			95	7
8	5	3	2	9	2			3	2	3	3		2	2	1	1		1	3	3	4	1	2	2	2	1	2	1	2	2			6	2	1	2			213	8
9																											3			1									36	9
10	4	2	2	4	1			2	3	3	2		2	2	1	1			2	2	4	2	2	2	2	1	3	2	2	13	1		2	2	1	2			243	10
11																																								11
12																																								12
13	13	8	6	11	5	1	1	6	10	9	6	1	7	6	2	2		1	7	7	11	6	5	6	6	10	4	1	2	1	3	1	10	7	4	5	1		1019	13
14	1							1	1																	3													54	14
15	14	4	4	6	3	1	1	8	2	7	3		2	6	1			1	11	2		4	2			1	3	2	2	2	2		5	2	3	1			948	15
SUB TOTAL	56	28	25	46	21	3	5	40	23	43	34	2	28	31	10	14	1	1	7	50	37	56	26	35	30	37	40	19	30	19	26	10	1	43	37	25	24	5	3745	SUB TOTAL
GRAND TOTAL	663	390	328	607	265	43	3	76	647	421	653	551	30	424	368	123	3	146		3	4	85	1	581	460	686	241	354	363	325	375	216	360	123	141	101	38	519	441	218	258	33		40732

External Stations

Zone of Origin	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	SUB TOTAL	GRAND TOTAL	ZONE NO
1																		1
2																		2
3						1							2		2	5	78	3
4						4	1	1		1			8	1	8	24	302	4
5															1	1	20	5
6			1	4			3	7	1	4			12		4	36	803	6
7				1		3		1		1			2		1	9	104	7
8				1		7	1			2			6		4	21	234	8
9						1				1			1		1	4	40	9
10				1		4	1	2	1				9	1	4	23	266	10
11																		11
12																		12
13			2	8		12	2	6	1	9				2	34	76	1095	13
14				1						1			2		5	9	63	14
15			2	8	1	4	1	4	1	4			34	5		64	1012	15
SUB TOTAL			5	24	1	36	9	21	4	23			76	9	64	272	4017	SUB TOTAL
GRAND TOTAL			78	302	20	803	104	234	40	266			1095	63	1012	4017	44749	GRAND TOTAL

GREAT FALLS URBAN TRANSPORTATION STUDY

POPULATION AND PASSENGER CAR REGISTRATION TRENDS

CASCADE COUNTY

1950 — 1962

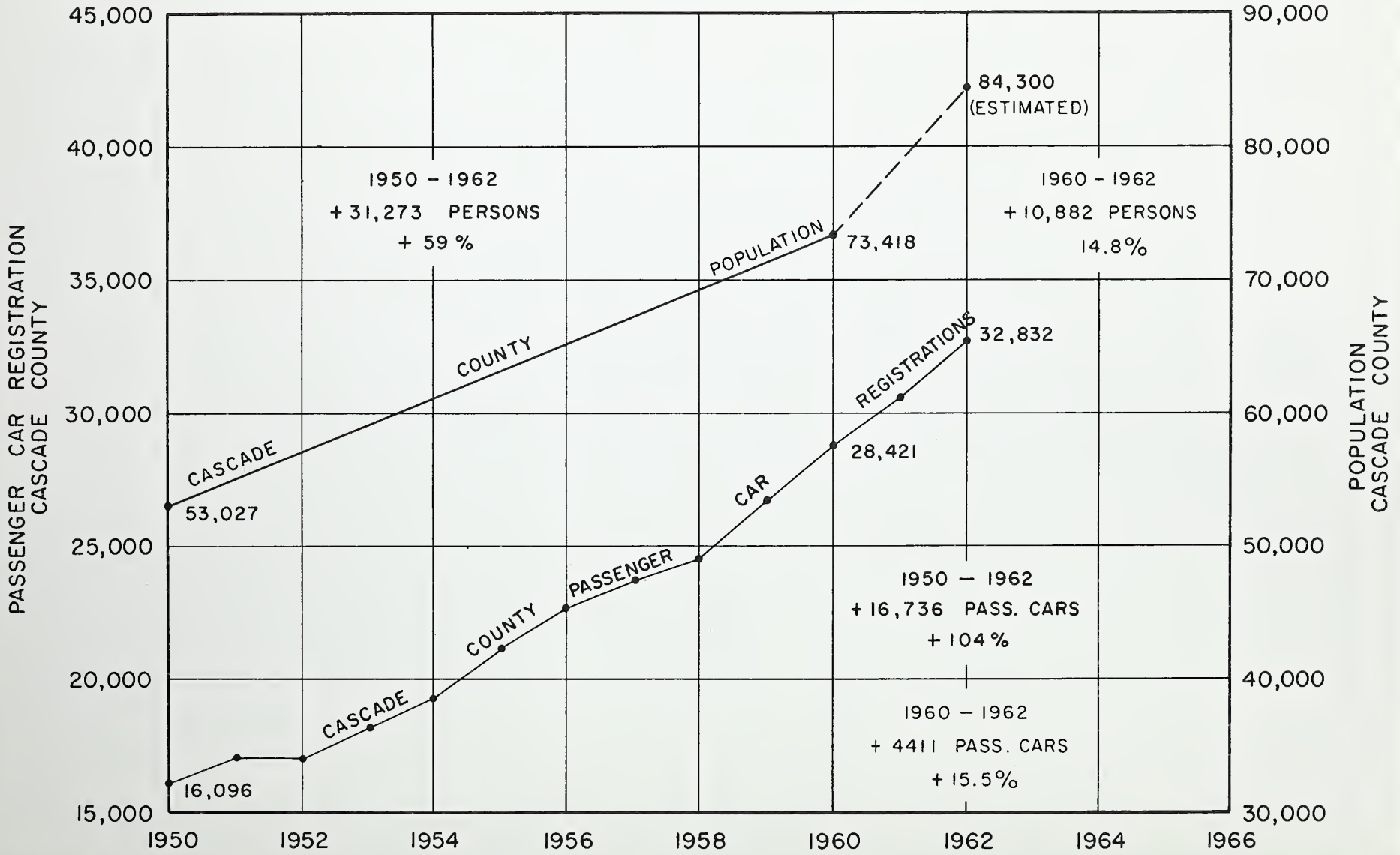

EXHIBIT 40

GREAT FALLS URBAN TRANSPORTATION STUDY

PUBLIC UTILITY TRENDS

1952 – 1962

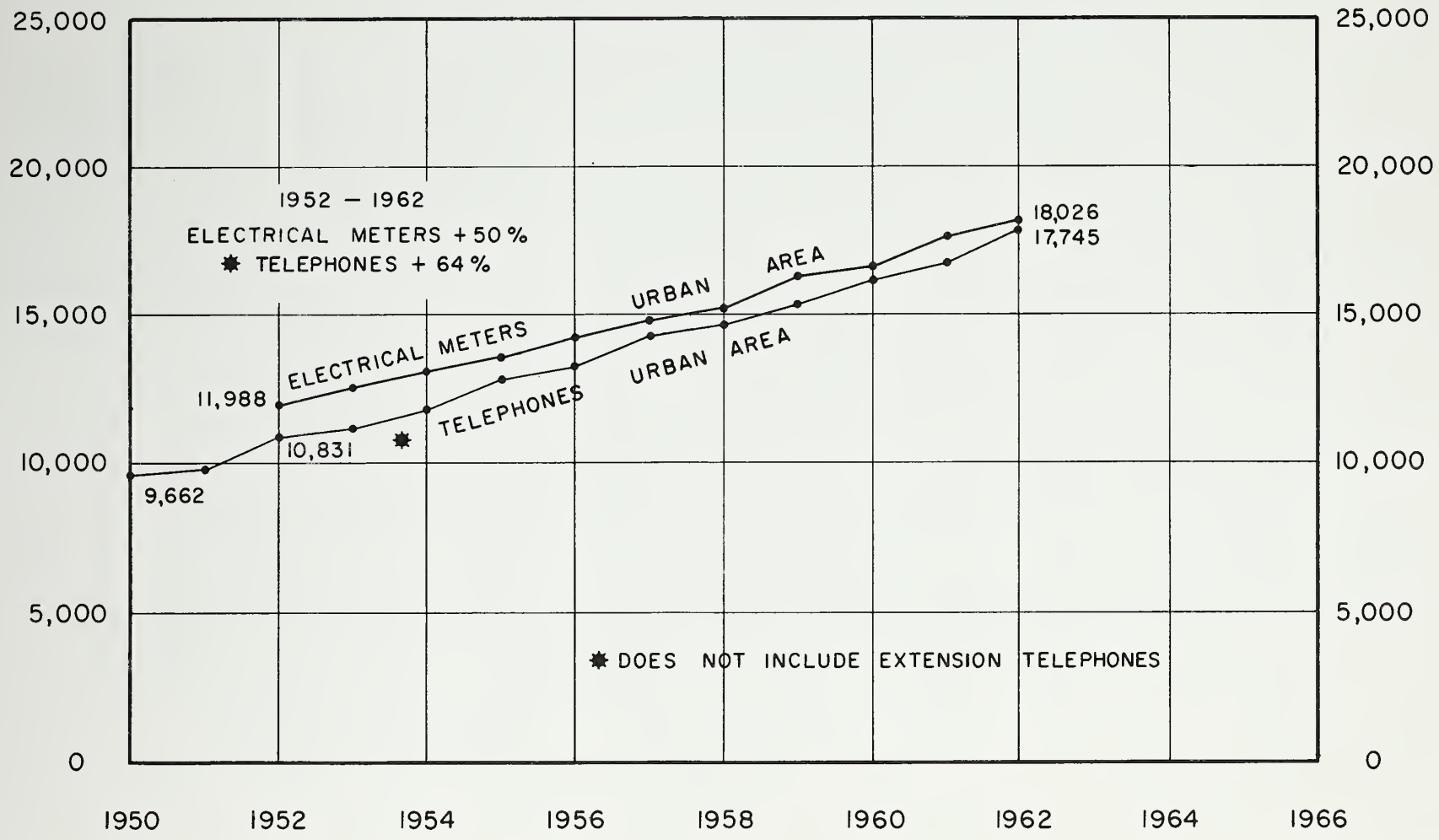

EXHIBIT 41

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GREAT FALLS URBAN TRANSPORTATION STUDY

PUBLIC UTILITY TRENDS

1950 — 1962

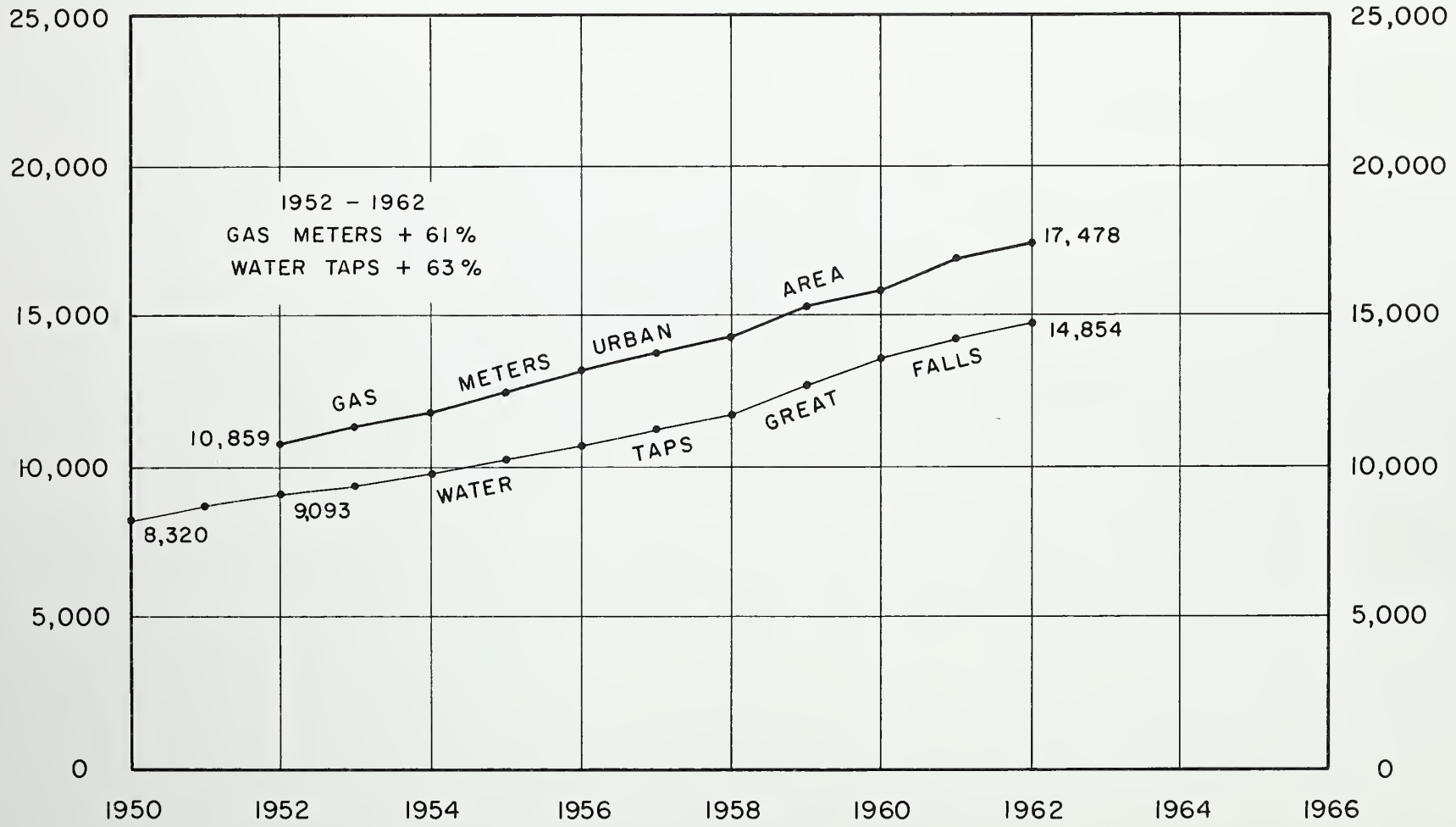

EXHIBIT 42
150

GREAT FALLS URBAN TRANSPORTATION STUDY

SCHOOL CENSUS AND PUBLIC SCHOOL ENROLLMENT

DISTRICT NO. 1 (URBAN AREA)

1950 – 1962

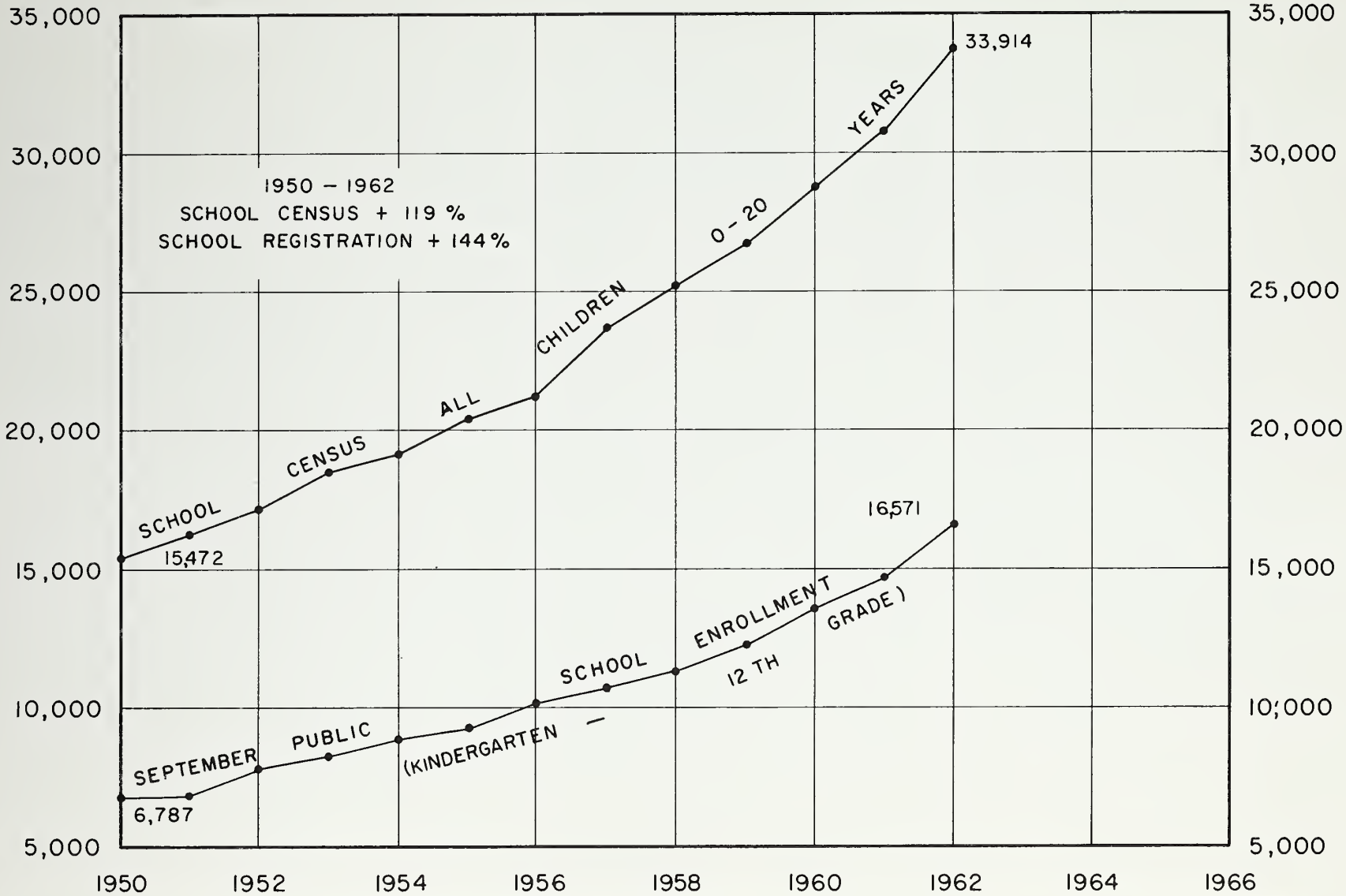

EXHIBIT 43
151